

ORAL HEALTH

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A Dentist Writes From the Front

“**D**OCTOR CAIRD, Professor of Surgery, Edinburgh University, previous to performing, upon a fellow officer, an operation for appendicitis, summoned a member of the Canadian Army Dental Corps that the mouth of the patient might be put in a condition of health. Oral Sepsis is rapidly coming to the front for proper consideration.”

Before undertaking an operation which will lower the vital forces of the body and render the patient more susceptible to disease, the careful surgeon eliminates every source of infection, and in a large percentage of cases the most prolific of these is the oral cavity.



MAJOR CHARLES A. CORRIGAN, D.S.O.
of Royal College of Dental Surgeons, Toronto.

Major Corrigan has served in the Canadian Army Service Corps, France, since the early days of the war, and was recently awarded the Distinguished Service Order. Major Corrigan is married, and his wife is serving as a nurse in a hospital in Etaples, France.

ORAL HEALTH

A JOURNAL THAT STANDS FOR THE "OUNCE OF PREVENTION," AS WELL AS THE "POUND OF CURE"

VOL. 7

TORONTO, JANUARY 1917

No. 1

Fixed Bridgework

A. A. STEWART, D.D.S., TORONTO, PROFESSOR CROWN AND BRIDGE DEPARTMENT, ROYAL COLLEGE OF DENTAL SURGEONS, OF ONTARIO.

FOR several years past fixed bridgework has been the subject of much adverse criticism at the hands of both dental and medical practitioners. It has been criticized from all standpoints, from that of mechanics, from that of its effect on the abutments, and from the sanitary point of view. Much thought has been given and work done by the dental profession to produce something that would overcome all these objections, but unfortunately the greatest amount of this thought and experimentation has been done along the line of removable bridgework, and not sufficient to the improvement of the principles of fixed bridgework itself.

The result of this has been that now we have an abundance of methods and attachments for removable bridgework and a tendency to condemn all bridgework of the fixed variety. In the opinion of the writer there is still a large field for both types, and while the advent of the removable bridge has added greatly to the scope of the practice of bridgework, we should not be so enthusiastic over it that we discard the fixed bridge entirely. Some of the great essentials of bridgework which we have been striving to attain are these:

1. A bridge which does not irritate the soft tissues.
2. A bridge so constructed and made of such materials that it will not become coated with thickened mucous in those parts where it cannot be thoroughly cleansed mechanically.
3. A bridge which restores as nearly as possible the natural condition, both labially and lingually.

4. A bridge which presents as few angles as possible for the lodgement of food, and which presents as small an uncleansable area as possible.

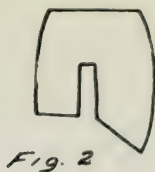
In all our work we have apparently overlooked the fact that a highly glazed porcelain presents a surface that is less irritating to the tissues than any other, and also the fact that highly glazed porcelain does not become coated in any mouth, no matter how indifferently that mouth may be cared for. We have heretofore placed gold in contact with the soft tissues, although we have seen how difficult it has been to keep the gold bright and clean. We have tried to be too æsthetic, hiding all gold and having nothing but porcelain showing in the mouth. The result has been disastrous in many mouths. We have had a bridge that could not be cleansed, a bridge which irritated the soft tissues and one which has very nearly placed bridge-work in the discard.

It is not the purpose here to go into the discussion of abutment pieces for bridgework, for I take it that the question of abutments has been pretty thoroughly settled, and that they must be left to the judgment of the individual in each case. I propose only to discuss here the intermediate part of the bridge. There will be no new principles involved, only a change in the method of procedure, and that change is simply the reversal of the present method of putting gold in contact, or in close proximity, to the soft tissues.

The technique of making such a bridge for a case when we have lost a bicuspid and molar, either upper or lower, with a bite that is normal (not too close a bite), is very simple and takes but very little more time, although possibly requires more careful attention to technique than any other.

Select for your dummy any tooth that you desire, a detachable crown, an Ash tube tooth, a diatoric tooth or a long pin facing. Ordinarily, a detachable crown serves very nicely. Select crowns that fit the case approximately, but noting carefully that the crowns are rather shorter than you would ordinarily select. The crowns should be such that at this time you do not require any grinding whatever and just reach from the occlusal surface of the opposing teeth to the soft tissue, or better still, just a little short of the soft tissue. If you are using a crown of high fusing porcelain, bake high fusing body of approximately the same shade as the crown, over the gingival end of the crown. No care need be given here as to the accurate shaping of the porcelain to have it fit the model, but care must be taken that no porcelain fills the hole in the crown which ordinarily receives the dowel. After adding your porcelain bake just a little more than a biscuit bake; we then have a crown with a piece of porcelain baked on the gingival and with the space in the centre as in Figure No. 1.

Take your porcelain crowns so baked and place them in position



on your model, grinding away sufficient of the porcelain that you have added so that the porcelain will rest on the soft tissue, but so that it will cover as small a portion of the soft tissue as possible, and thus leave as small an uncleanable area as you can without interfering with the æsthetic effect.

This having been done add a thin coating of enamel body and bake to a high glaze. Now proceed with the preparation of your occlusal surface. Grind sufficient of the porcelain away on the occlusal so that you will have sufficient thickness of gold when it is replaced with gold bands to give necessary strength to the bridge. In nearly every case you will have ground into the cavity in the centre of the crown. Your porcelain will then have the appearance, looking at it from a mesial aspect, of Figure No. 2.

To get a larger area of gold on the mesial and distal surfaces bevel your porcelain in those surfaces so that your gold, when made up, will project over your porcelain on those surfaces. Having your porcelain prepared, burnish or swedge a piece of 24k gold, 35 gauge, over the occlusal surface and trim to fit. Pierce your gold over the hole in the porcelain and insert to the bottom of the opening a piece of 14-gauge I. P. wire; wax and remove and fasten with solder. Now replace on porcelain and reburnish, assemble all your dummies and build up the occlusal surface with wax, being particularly careful to add sufficient wax at the labial so that the porcelain will be protected from strain when the piece is finished; each dummy will then have the appearance of Figure No. 3.

When the occlusal surfaces have been carefully carved, cast in a hard gold of high karat, not less than 22.

Now assemble all your parts, remove the porcelain by cutting away the model sufficiently to allow of their removal, invest and solder. The solder should be confined as much as possible to the mesial and distal surfaces so that the bridge will have the appearance and the feeling to the patient of individual crowns. Polish and set the porcelain with good crown and bridge cement and allow to harden.

You have now a bridge which appears as Figures Nos. 4 and 5.

The particular advantages of this bridge over the ordinary types of fixed bridges are these:

1. A highly glazed porcelain is in contact with the soft tissues, and this does not become coated and is tolerated by the tissue.
2. The uncleanable area in the bridge is reduced to a minimum.

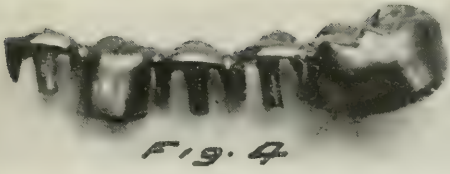


Fig. 4

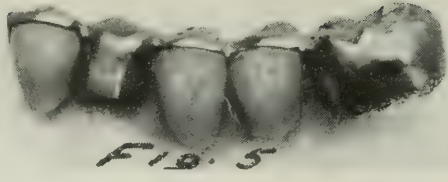


Fig. 5

3. It is much more comfortable to the patient, both as to the feeling of being individual crowns and the fact that there is no surface for the lodgement of food.

In cases where the bite is very close the same principle may be adopted by using the long pin facing and baking porcelain at the gingival. Figure 6 gives you a cross section of the finished dummy.

After the porcelain is added and the tooth is properly ground and glazed back in the ordinary way and built up with wax to the shape required, remove the wax and backing, insert graphite points in the openings made by the pins and cast. The same idea can be used in anterior cases, but the ordinary porcelain crown will nearly always suffice. Figure 7 shows a cross section of one of these crowns baked, ground, and Figure 8 the finished dummy.

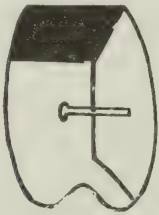


Fig. 6.



Fig. 7.



Fig. 8.

The work involved on this method is not difficult, nor does it involve as much time as one imagines. The results obtained are so satisfactory that it more than compensates for any additional time and effort.

Congratulations, Dr. Cowan

MAYOR COWAN, of Regina, has been re-elected by acclamation to the chief magistracy of the city of Regina. Dr. Cowan showed sporting blood by offering to pay the election expenses of any worthy man who would stand against him, but, notwithstanding, has been denied the pleasure of a contest. Dr. Cowan seems to have a liberal spattering of Irish blood, but our hearts warm toward him none the less on that account.

Root Canal Treatment*

RODRIGUES OTTOLENGUI, NEW YORK CITY.

PERHAPS the most potent problem which confronts the dental world to-day is the problem of correctly treating and filling root canals. This problem, of course, has always been before the profession as a vital issue, but it is more vital than ever. It is a problem that never has been solved, and has not yet been solved, but the solution is nearer than ever.

At the outset let me declare that I am not posing as one who can fill the canals of all teeth to their apices; but I wish to present a technique with which I fill more canals to their apices this year than I did last year, and with which, through practice, I expect to be able to obtain a greater proportion of success as the years go by. It is a technique, too, with which when a canal is filled to its apex we may feel reasonably sure that it will not become infected, if it had not been infected at the outset.

In regard to filling all roots to their ends, carping critics, such men as we always find standing as obstacles in the path of progress, men who invariably count as impossible the things they cannot themselves do; such men, I say, are repeatedly approaching me at meetings to hand me some tooth with twisted or distorted roots with the half sneering remark: "I presume that one would be easy for you."

Such arguments, if they prove anything at all, merely prove that there are teeth the canals of which are beyond human skill. Yet even some of these would be found surprisingly easy if treated in the mouth, for there be many tortuous canals that can be successfully managed, provided the operator does not himself block his channel with faulty instrumentation.

At all events the most that we are obliged to admit is that there are some teeth which we cannot successfully treat. This is true of all surgical operations, and root canal work is a surgical operation, an operation demanding the most exacting and slavish obedience to routine. If we would but dismiss from our minds these impossible cases; if we would constantly say to ourselves, "Perhaps Dr. X—— could fill this root," soon, very soon we would find less roots that we must send over to Dr. X—— for treatment.

Root canal treatment may be divided into two distinct phases. The first includes all those cases that come to us uninfected, teeth having living pulps which, however, require removal. Second, are those cases where infection has already supervened. These latter are to be subdivided into: those that may be cured, those that are beyond cure, and those that might have been cured if some previous operator

(* Read before Toronto Dental Society, December, 1916.)

had not mutilated the canals with drills or broken instruments. My friends, let us beware of so treating teeth that when our patient appeals to a confrere he shall find the afflicted tooth in this last class because of our maltreatment, mistreatment, or misfortune. And let me inject here the comment that misfortunes, such as the breaking of instruments may be minimized if constantly kept in mind as possible, so that the maximum of caution is observed.

Let us then briefly outline the technique of the management of these various conditions.

REMOVAL OF LIVING PULPS.

Where the pulp is alive at the outset, it is manifestly the duty of the operator to remove it without infecting the canal or apical tissues. This requires constant attention to aseptic and antiseptic precautions. In root canal work we cannot hope to make our dental asepsis equal to true surgical asepsis, but if we recognize the weak spots in our attempts at asepsis we may fully protect the patient with germicidal or antiseptic agents. As, for example, we cannot sterilize the entire mouth, but we can, with fair certainty, sterilize the immediate field of operation; we may then isolate this field with the rubber dam, and we can then again sterilize the included teeth and the dam itself.

Before removing a pulp, therefore, and the routine is the same in all canal treatment, the gums and four or five teeth should be thoroughly cleansed, using a disclosing solution to be sure that all plaques have been removed, and tapes, with pumice or what I prefer, a fine sillex, between the teeth. The parts are then to be thoroughly sprayed to make sure that no debris remains. Next use a cotton swab dipped in alcohol and rub the gum well to remove all inspissated mucous. Finally, coat the gums and teeth with tincture iodine, forcing the iodine under the gingival crevice with a sharpened orangewood blade. The rubber dam should be washed with a germicidal soap and boiled. After placing it so as to isolate four teeth at least, the surfaces of all teeth and of the dam itself should be swabbed with alcohol. This alcoholic swab may be repeated throughout the operation, especially when blood or seepage of any kind escapes from the canal and flows upon the dam or adjacent teeth.

ARSENIC.

Arsenic should never be used. I say never because there is practically no condition in which it is excusable. If pressure anesthesia should not prove effectual, we still have conductive anesthesia as well as intra-osseous anesthesia. In extreme cases we may even use full anesthesia, for which purposes I have used nitrous oxide and oxygen, and even chloroform.

In ordinary cases, however, pressure anesthesia answers every purpose, provided the proper technique be employed and patience be

exhibited. Operators frequently remove pulps, causing pain to the patient and a lessening respect for the method in the dentist's own mind, when one more three minutes' application of the anesthetic would have brought about a painless operation.

Where the pulp is not actually exposed, but nevertheless must be removed, the exposure of the pulp may usually be accomplished with comparatively little pain by the use of the chloride of ethyl spray, followed by the utilization of large new sharp round burs. They should be new because, if never before used on teeth, they are less likely to be contaminated, and may be rendered safe if dipped in alcohol and then set on fire two or three times, which occupies but a few seconds. The bur should be sharp because sharp burs cut with less jar, and therefore with less pain. They should be large and used with a lateral sweep so as to avoid dipping into the canal, thus stabbing the vital pulp. Just as soon as the minutest exposure is evidenced by the escape of a drop of blood the anesthetic should be used.

PRESSURE ANESTHESIA.

A drop of sterile water is dropped on a clean sterile slab and one or two billets of neurocaine dropped into this. No effort should be made to dissolve the billet; it should merely be saturated. Such a billet is then picked up on a pledget of cotton, taken from a receptacle which is brought direct from the sterilizer, and with this the wet neurocaine is placed over the exposure. Observe that there is little or no water, hence the cavity is comparatively dry, an important matter. Next a mass of pure beeswax is made slightly plastic and pressed into the cavity and over the cotton. Very light pressure is used at first and the case is allowed to rest for half a minute. Then a large egg-shaped burnisher is placed upon the wax and slowly increasing pressure is made in the direction of the pulp. This may cause the patient to wince at first, but this shock soon subsides. When a burnisher can be forced quite through the wax, anesthesia is usually profound and pulp removal painless.

The procedure, of course, is not always as simple as here outlined, but success usually follows patience and repeated applications. It is because of this that a full hour should be set aside for this operation. It should not be hurried, because once begun it should never be partly completed and then left for the next day. Disaster almost always follows such a course.

PULP REMOVAL.

To remove a pulp use the finest barbed broach procurable. Turn the barbs towards one wall of the canal and endeavor to slip the broach between the pulp and the canal wall as far as possible. Then turn it around once and slowly withdraw. The pulp in most cases will come away entire.

The removal of a pulp is commonly followed by a copious flow of blood. This should be encouraged, never checked with hemostatics. Either use paper canal points to invite the flow of blood or syringe out with warm sterile water. Allow the bleeding to cease naturally. This depletes the capillaries and renders secondary hemorrhage less likely.

SECONDARY HEMORRHAGE.

This secondary hemorrhage, however is always a possibility, and if the canal be blocked with cotton charged with some oily drug, as is common practice, this resumption of bleeding causes an accumulation of blood about the apex, often inducing an acute pericementitis which may result in infection and abscess, a most disagreeable denouement where the patient originally presents with an uninfected tooth. It was such an instance in my own practice that caused me to abandon medicated dressings in root canals.

After pulp removal, I now dress the canal either with a dry sterile cotton dressing, or with a paper cone where the canal is large enough. The paper cone is more desirable where it can be used because it is more easily kept sterile. The object of this dry dressing is to draw up into the canal by capillary attraction any blood that may seep from the capillaries after the tooth has been sealed up. This, fortunately, does not always occur, but let an operator try this method and some day, on the second visit, find his dressing saturated with blood, while the tooth itself has remained absolutely comfortable, and he must become convinced of its efficaciousness.

REMOVAL OF PULP TERMINALS.

Before passing from the subject of pulp removal I must allude to one important particular. No one can tell by examination of a removed pulp whether the pulp has come away entire or not. Quite often the main body of the pulp is torn away leaving some pulp tissues still adherent at the apex. If this is left in till anesthesia subsides it becomes one of the most painful conditions that I know of to handle at a subsequent sitting. It is essential, therefore, to make sure that no particle of pulp is left. This can be accomplished by using an instrument known under the somewhat extraordinary name "Apexographer." This is a very fine, smooth bristle, with two or three barbs at the extreme point. Its use after the main portion of the pulp has been removed will often surprise the operator by the size of the fragment of pulp that will be brought away.

INFECTED TEETH.

We come now to infected teeth. If we know positively that an active abscess is present there is no object in delaying treatment. I have frequently incubated material removed from the canals of such teeth, and also material collected from beyond the foramen, and invariably we find the same organisms. Where the pulp canal alone

is infected we should proceed more cautiously, and Buckley's method of introducing formo-cresol into the pulp chamber and sealing it in for twenty-four hours will often obviate the danger of forcing infected material into the apical area. However, I never saturate a dressing with formo-cresol and force it up into the canal. It is quite sufficiently effective placed lightly into the coronal end of the canal.

ALVEOLAR ABSCESS.

Of abscesses we have several varieties. The acute abscess, such as may result from sudden death of a pulp by trauma, with a rapid accretion of pus and considerable swelling usually alarms the patient, but treatment is comparatively simple in most cases. An incision with a lance and dressing with iodoform gauze for two or three days will resolve the conditions to a state of quiescence when the canal work may be done. If the latter is successfully accomplished all traces of the abscess will disappear.

Chronic abscess is not so simple, and treatment and cure will depend upon the extent of the infection, and much may be learned from a radiograph.

Many claims are made that such conditions may be cured by ionization. I hope so, and am still endeavoring to learn how to accomplish it. Thus far, however, I have not been very successful. My experience has generally been that upon opening the tooth and draining the abscess through the canal, the fistula may close, but even after repeated ionization, upon filling the root canal and tooth, the fistula has reopened, showing that the abscess has persisted. The recourse then has been to root amputation, an operation in which every so-called "Surgeon Dentist" should become proficient. Otherwise he should erase the word "surgeon" from his cards and stationery.

I am quite aware that the above is contrary to the reported experience of other men. You need not therefore accept this as a fact. Quite possibly my technique has been faulty.

GRANULOMAS.

We come now to the much discussed abscess without fistula. It is very questionable in my mind whether this should longer be considered an abscess at all. Usually in these cases the radiograph shows a well defined area of bone rarification, and if the tooth be extracted we find at the apex a mass of soft tissue which, years ago, was called an abscess sac, but which now is spoken of as a granuloma. If the word sac conveys the idea of a tissue bag filled with pus, it is a misnomer. Except in the case of true cysts these tumors are very solid. Whether they begin as a result of infection, or become infected subsequently, is another question open to discussion. That organisms can be isolated from these granulomas after extraction seems to be the common experience. Yet sections of granulomas, when stained for bacteria, have thus far defied our experimental

research. That the organisms should abide solely at the periphery, thus making it possible to incubate them by merely dipping the extracted root end into bouillon seems extraordinary. As I said at the outset, this root canal question has not yet been fully studied out.

However, it is exactly these granulomatous cases that are said to be the most prolific causes of distant symptoms. Hence, they must be cured, eradicated, or the teeth extracted. Fortunately, ionization in these cases seems to be efficacious in many instances. At least we have evidence, as I shall show you, of such conditions clearing up and giving place to growth of new bone after ionization. Some say that these cases have been cured by ionization; others that they have cleared up as a result of the canal treatment.

It seems to me that the important point is that cure is possible. At present the burden of proof or disproof lies with the opponents of ionization, none of whom has as yet shown such radiographic evidence of cures effected, as have been presented by those using ionization. I am therefore inclined to the belief that there is much virtue in ionization for the cure of those cases where granulomas are present.

ROOT CANAL FILLING.

In all cases, of course, root canal filling entails the same technique. The main point to be secured is the hermetical sealing of the canal from end to end. Some tell us that we must fill to the end, but not beyond. Unfortunately, these men do not give us a technique that will accomplish this. Dr. Rhein and many others now believe that unless the root canal filling passes slightly beyond the end, we can have no assurance that the foramen is sealed.

With this view I am in accord. At the same time I also agree with those that argue that gutta percha is a foreign body, and however tolerant the tissues may be to gutta percha, these same tissues certainly can live in peace and comfort without such intrusion. Hence it is my endeavor to force a little chloropercha through the foramen, but to prevent the actual cone from protruding. In this manner we may accomplish the sealing of the foramen, or even the overflowing of the chloropercha over the end of the root where the cementum itself may be stripped off, but we avoid projecting a mass of gutta percha into the tissues beyond.

Perhaps the best method of preventing the protrusion of the cone is not to use a cone at all. Formerly I would cut off the extreme tip of a cone and gently force this to the end and into the chloropercha. The idea was that the chloropercha would absorb this tiny tip of the gutta percha cone, and actual protrusion would be prevented.

Nowadays I believe I have improved on this method. I have persuaded the S. S. White Co. to put up for us gutta percha points, not cone shaped at all, but of equal diameter throughout. These are so fine that one might say they are cut from gutta percha wire if you

can imagine such a thing. Perhaps they may be called gutta percha rods.

The main fact is that they are so fine that they pass into very minute canals, and are quickly absorbed into the previously placed chloropercha, without danger of protruding one through the end, save of course where the foramen is abnormally large, in which case a different technique is requisite.

The method is to dry the canal with warm air. Then saturate it with eucalyptol, thus excluding air, and lubricating the canal at the same time. This is followed with chloropercha, introduced with fine canal instruments and a pumping motion. I recommend those who have never done this to draw out some glass pipettes into attenuated simulations of root canals, and practise this introduction of the chloropercha. The transparency of the glass will permit the operator to watch the action of the chloropercha, and in this manner he will comprehend the technique better and will be less liable to force unnecessary quantities of the material through the end of the root.

Next the gutta percha rods are introduced, at first using perhaps but half a rod. As these rods are forced one after the other into the canal, they are slowly incorporated into the chloropercha, which at first being of the consistency of milk let us say, soon becomes as thick as cream, then like a heavy oil, then like a melted tar, and finally stiffer and stiffer, until in the end we have changed the mass into a homogeneous whole, absolutely of the form of the canal and conforming with the canal walls.

Thus we do not fill a canal with chloropercha followed by a cone of gutta percha. But we pursue a method of gradually altering fluid or dissolved gutta percha into a solid mass, with no chloropercha left, and hence no shrinkage from evaporation possible.

At that stage when the gutta percha in the canal is of a tar-like consistency, no extreme force having been used up to this moment, a cone, which is not too large, may be forced into the canal and malleted home, upon which a slight oozing of the still slightly soft mass through the end of the root results in a sealing of the foramen without forcing an extra quantity of material through. The success of this will depend upon the deftness of the operator, but the results improve with practice.

Resume of Discussion of Dr. Ottolengui's Paper

BY R. G. McLAUGHLIN, D.D.S.

THE subject for the gathering was the all-important one of root canal treatment. And such a subject, with the name of Dr. Ottolengui attached, was a guarantee of a full house. The members were out in full force—something over a hundred all told.

There was an air of expectancy. You felt it everywhere. The reason was not hard to find. We all have had our difficulties in root canal work, and we were looking for more light, and was not Dr. Ottolengui to be an angel of that light?

The dining-room was crowded to the doors and the spirit of good fellowship was manifest. "What a change?" was the remark overheard at more than one table. The dentists of Toronto are really developing a fine social spirit, and consequently are having a real good time.

Dr. Ottolengui's opening words were modest ones, and bespoke the man who fully understands the magnitude of his task. His paper on the subject was not lengthy, and was merely intended as an introduction to the really good things of the evening—his lantern slides and the after discussion.

The paper itself, while containing few things that were actually new, placed before the audience a logical procedure and technique that appealed to one's best reason. Dr. Ottolengui has no use for arsenic in the devitalization of the pulp. In his hands it had too frequently left its sting of apical inflammation and a lame tooth. Pressure anesthesia took the place of arsenic in his practice. In the opening of root canals, his word of advice was, "Go slowly and cautiously." You cannot open up root canals in a hurry. To attempt such frequently results in a blocked canal or punctured root. Use the finest broaches and files and work up very, very slowly. Dr. Ottolengui does not advocate a large canal, but "by all means get to the apex." Again, in devitalizing an exposed pulp by pressure anesthesia, he advises the removal of every particle of pulp at that sitting. If allowed to remain until the next appointment, you will have a painful operation.

The ordinary gutta percha cones have been discarded by the doctor in his practice. They too often choke the canal at the coronal end before the point reaches the apex. In their place he uses gutta percha rods with parallel sides, manufactured at his request by the S. S. White Company. He advises pumping this chlora percha persistently into the canal and inserts the fine gutta percha rod with a pumping motion until the apex is reached and a small portion of the chlora percha is through the apical foramen.

Dr. Ottolengui's numerous lantern slides were well chosen to illustrate the subject in hand. They were gems: clear, well defined and easily read. They proved beyond a doubt that his root canals were filled right to the apex, and then some. He did not advocate driving the gutta percha rod beyond the apex, but it was all important that the apex should be tightly sealed, and better by far that the gutta percha rod be forced a little beyond that point, than to fall too short. And, again, his slides proved that, in the case of rarified area surrounding root ends, healthy granulations had presented in spite of the

fact that much of the gutta percha had been forced through the apex.

The discussion which followed Dr. Ottolengui's deliverance was interesting. It was obvious that all did not agree with the essayist. Dr. Gordon McLean, Dr. Chas. Pearson and Dr. F. C. Husband were among those who did not agree with all that the essayist had said. Dr. Pearson did not agree that arsenic, as a devitalizing agent, was harmful and should be entirely eliminated. "How do you know that it is the arsenic that produces these apical inflammations you speak of?" asked Dr. Pearson. Back came the answer from Dr. Ottolengui, clear and concise: "For years, in my root canal work, when using arsenic I had many cases of such apical difficulties, often followed by what is known as a lame tooth. I looked for the cause and finally suspected the arsenic. Since discarding the use of this agent these difficulties I speak of have been reduced to a minimum." He thought such evidence pretty strong, as did many in the audience.

The use of adrenalin as a styptic in pressure anesthesia was discouraged by Dr. Ottolengui. "Why?" asked Dr. Husband, who had looked upon it with favor because of its styptic qualities. "That is just why you should not use it," answered the essayist. "No attempt should be made to prematurely check the flow of blood from the punctured vessels at the apex of the root. Let these vessels empty themselves without hindrance and there will be little danger of the secondary hemorrhage, which so often causes after infection and trouble."

The treatment of chronic abscesses by ionization came in for considerable discussion. Dr. Ottolengui claimed to have had meagre success in the use of this method of treatment. Ionization, in his opinion, is still in the realm of speculation.

The meeting was a prolonged one, but every minute was interesting. The writer has no hesitation in predicting better root canal work in Toronto because of Dr. Ottolengui's visit.

Another Name Added to Honor Roll

PTE. A. BOWES, A.M.C., for four months a member of the staff of the Base Hospital, Toronto, died at that institution from pneumonia, which developed during his Christmas leave. Pte. Bowes was a dentist by profession, but enlisted to do his bit with the Canadian Army Medical Corps. His age was 55.

Pte. Bowes was a son of the late John Bowes, Public Works Department, Ottawa, and a brother-in-law of Martin O'Gara, K.C., police magistrate of the same city. Some twenty-five years ago he practised his profession at Owen Sound, and later moved to Singapore, Straits Settlements. His widow survives him, and may feel assured of the sincere sympathy of the entire dental profession.

Our Buffalo Letter

BY HABEC.

'NOTHER LOAD OF HABEC.

A RECENT letter from Wallace, containing a long and well-sharpened prod, has again caused our dessicated bones to rattle and awaken from prolonged lethargy. At the present moment, while whirling along down the shores of the beautiful Hudson River, after having just passed the historic lair of our ancient and respected archetype, Rip Van Winkle, the spirit of resurrection once again has stirred our enfrognated vital fluid, and the results are wished on the hapless readers of ORAL HEALTH, just as though the war had not brought you trouble enough. You know the Bank of Misfortune compounds the interest much more frequently than all other institutions for accumulation, therefore summon the remainder of your flagging fortitude for the ordeal that is before you.

Well, little old New York is still in the same place and the turmoil is as great as ever. Habec visited the Island to start something—and he did. A meeting was held at which a resolution was passed authorizing the formation of three "Sectional Unit" clubs for the study of war oral and dental surgery, one each, respectively, in the Bronx, Manhattan and Brooklyn. Habec also slipped over to Philadelphia and interviewed Dr. Kirk, who engaged to establish a central unit at the Evans Institute. This is as we would have it, for with Dr. Kirk and the Evans Institute to back up this great educational movement, we feel that an important step toward the consummation of our ambition has been made.

All the above refers to the efforts of the Preparedness League of American Dentists, a subject on which Habec is positively and incurably "bug," and to which he is endeavoring to act as a sort of Godfather. Our great object in forwarding its interests is to prepare the profession of the United States to be able to do war oral surgery, should it be required of us, and thereby give to our country the largest, best equipped and most representative Officers' Reserve Corps, Dental Section, of any country of the world. We figure that we owe this to our government, and with united effort it can be accomplished.

In Canada, as in the United States, oral surgery has been the least developed of any branch of our profession, but the stirring events of the last two years have demonstrated that we *must* prepare ourselves to assume our rightful position as scientific professional men. Habec has this thought in mind, which he has hardly dared to mention: that the ultimate result of this movement will be the introduction of a standardized course in dental and oral surgery in every dental institution in America. We must have it and now is the

most propitious time. Dr. Kirk's editorial in the December *Cosmos* gives this phase of it a splendid presentation. We are sure our Canadian friends are with us in this great work.

JUST TO PRESERVE OUR WELL EARNED REPUTATION.

As a chronic kicker we wish to spring the following: Why is it that a majority of the medical men still persist in diagnosing conditions by the dental radiograph without the aid of the dentist? Why, pray, should we be looked upon as incompetent to judge of conditions among which we live and move almost every day of our existence? Why, also, should we allow them to force us to extract teeth that we are morally certain should be saved?

These questions, to us, are fundamental, and should be settled once and for all time for the good of humanity. It is difficult for us to impress upon the physician the economic importance of the individual tooth. The "removal of the cause (?)" is their only thought, no matter what the ultimate effect may be. In ninety per cent. of such cases, they gamble at a "hundred to one shot" on general results, and the results to be far more general than they suspect.

Habec still clings to the good old orthodox belief that the Supreme Architect of the human clothes rack had a perfectly legitimate reason for installing an up-to-date hash plant, equipped with thirty-two beautiful ivories, to furnish the interior of our faces. There's just about as much reason for cutting off a finger to cure a "hang-nail" as there is for extracting a left lower lateral with a simple sinus abscess to cure iritis of the right eye. Habec saw this done very recently, while both tonsils were tolerated, which were appropriately described by the specialist as "rotten." The removal of the tooth was deemed so urgent by the physician that the dentist was requested to extract it on Sunday. Several sound, vital molars and bicuspid were also placed under the ban, and it took both the radiographer and Habec to neutralize the radical element.

This is our own little home-grown argument: Suppose, as a point for discussion, that the poor little lateral did cause the iritis, had not the organism already caused the mischief and, by immediately opening the root canal, removing the disintegrated pulp tissue, curetting the sinus cavity and sterilizing the field, would not the supposed cause be more speedily and thoroughly removed than by simple removal of the tooth without curetment or special sterilization? Should not the physician be made to realize that the cause, if so it is, has gone beyond, and really has become foreign to the tooth itself, when the infection has attacked the periapical tissue? With a good periodontal membrane, nineteen out of twenty similar teeth may be saved, and we must prove it to the medical profession or be shunted onto the switch as obstructionists instead of constructionists.

We, therefore, implore our professional friends to get out the little pick and shovel and not be stingy with the other fellow's infected

alveolus, but cut away just as though it was your worst enemy. Formalin has, for several years, raised "Mary Ellen" with the periodontal membrane, the alveolus and the pulp in consequence. When it has been used in the tooth, the prospect of ultimate success is much reduced; nevertheless, there usually is a fighting chance.

Habec has much more conversation to give out on this subject, but he also has a heart, and will spare you further agony at this time. With your permission, we will open this topic in our next under the head of unfinished business.

HABEC.

Freshman Class, Royal College of Dental Surgeons, Volunteers its Services to the C.A.D.C.

THE Canadian Army Dental Corps, Overseas, has, during the past three months, requisitioned the following men: 200 graduates, 270 sergeants and 200 batmen. Of this number, 75 of each group have already proceeded overseas. The balance required to complete the number asked for is: 125 graduates, 195 sergeants and 125 batmen. It is understood that these men will be sent overseas fully equipped with dental instruments, supplies, etc., and this fact will doubtless occasion many months' delay in sending the next draft of officers overseas. However, in addition to the regular proportion of one batman and one sergeant to each officer, 70 additional sergeants are required, and it is the intention of the authorities to send these 70 sergeants overseas at the earliest possible moment.

The demand for sergeants was so urgent that the freshman class of the Royal College of Dental Surgeons has, as a class, volunteered assistance. Of the 96 members, it is thought that a large percentage will be found physically fit and otherwise able to undertake this work. To meet the further demand, the R.C.D.S. has offered to recruit a special class of 125 physically fit young men possessing matriculation requirements. It is the present intention that this special class commence work the fifth of February and continue for from three to six months, according as the progress of the class and the demand of the C.A.D.C. for overseas service.

It has been suggested that a large percentage of this special freshman class could be recruited from Canadian undergraduate arts students. The balance of the number will have to be secured from the High schools, or from among those in business life holding matriculation standing. The whole plan has been discussed with the Ontario University authorities and has received their hearty approval. The University of Toronto will doubtless co-operate in every way that these special students may receive complete first year college standing.

Those of the present freshman class who desire to enlist will

be placed in a separate laboratory and given special instruction that they may be efficient as C.A.D.C. sergeants and sufficiently rapid in their work to accomplish what is expected of them.

The Director of Dental Services, Lt.-Col. W. B. Clayton, has assured the R.C.D.S. that he will render what assistance he can, and has given the college an outline of what these men should be taught to best fit them for service in the C.A.D.C. Col. Clayton will doubtless either visit the classes himself, or detail some other officer, for the purpose of learning the progress these recruits are making in their work.

The college will, of course, train the men along the lines suggested by Lt.-Col. Clayton, and will co-operate with the C.A.D.C. in every way that these recruits may be given the best course possible.

The offer of assistance in the training and supply of sergeants was made to Lt.-Col. Clayton. Subsequently, Col. Clayton, along with a representative of the R.C.D.S., presented the matter to the Adjutant-General. The latter not only concurred in the plan itself, but expressed appreciation of the attitude of the R.C.D.S. in the matter.

C.A.D.C. Surgery, Camp Borden



THE above photograph illustrates the equipment of the Dental Corps in the concentration camps in Canada. The white enamel instrument stands are of wooden construction. Attention is also drawn to the enamel wash basins with supply of hot and cold water, Allcord engines, and portable dental chairs.

THE COMPENDIUM

This Department is Edited by
THOMAS COWLING, D.D.S., Toronto

A SYNOPSIS OF CURRENT LITERATURE RELATING
TO THE SCIENCE AND PRACTICE OF DENTISTRY

CONDUCTIVE ANESTHESIA.

H. A. POTTS, M.D., F.A.C.S. (Chicago), writes about conductive anesthesia for dental purposes. A full report of his thesis appears in December issue of the *Dental Review*, and it contains many valuable suggestions for every day use. Dr. Potts, in the opening chapter of his paper, suggests that many of the failures or partial failures with conductive anesthesia have been due to a lack of thorough comprehension of the subject, both from an anatomical and operative standpoint. "Many operators," he says, "have gotten the idea that the induction of conductive anesthesia alone in the jaws will enable them to operate painlessly in all classes of cases. This is not true if the part to be operated upon be supplied by nerve-trunks other than the one injected. In other cases it is not necessary to inject a nerve-trunk when the desired result can be accomplished by infiltration, which is probably less harmful than the injection of a nerve-trunk, especially if it be done repeatedly. It has not been proven that repeated injection of a nerve-trunk may cause a neuritis or tumor or some pathological change of a more or less serious nature. The method and technique must be chosen by the needs of each particular case, consequently a thorough understanding of the fundamental principles of local as well as conductive anesthesia is necessary."

A brief account of the history of local anesthesia is given, the author dividing his survey into two divisions, viz.: (1) The period previous to the discovery of cocaine, and (2) the progress made since the discovery. The earliest attempts at producing local anesthesia included the use of vinegar, sacred alligator fat, Memphian stone, etc.; later on, warm instruments were used. During the sixteenth century an innovator by the name of Pere first used the tight bandage to cause compression of nerve trunks and so induce anesthesia. Needless to say, this practice was not wholly successful owing to the injurious effects consequent upon its use. The introduction of freezing mixtures, salt and ice, ether and ethyl-chlorid sprays is thought to have been the result of the observation that amputations in high, cold

altitudes were less painful. The year 1853 is one of the most notable in the history of medicine as well as anesthesia, in that it marks the introduction of the use of the hypodermic syringe by Alexander Wood, of Edinburgh. At first opium and morphine were used locally as anesthetics because the general systemic effects of these drugs had already been established.

The second period begins with the use of cocaine as an anesthetic. This is how the drug was first introduced. The natives of Peru and Bolivia used, in their religious rites, leaves of the coca erythroxylum plant, which grows in great abundance in these parts. The leaves were first treated with a quick-lime, then chewed by the natives; and as a result they were able to perform feats of great endurance. The Spaniards, on their conquest of these countries, forbade the use of this drug, and later on enacted measures to control its production. Scheyer brought some dried leaves to Europe, and Niemann and Lassen, pupils of Wohler, extracted the alkaloid cocaine. A report of the use of this drug as a local anesthetic was first given in a paper read by Koller before the Congress of Ophthalmologists at Heidelberg in 1884. From this time on there followed, in rapid succession, improvements in the methods of using cocaine. In 1885 Corning showed that its action was more rapid in a bloodless field, and that weaker solutions might be used under such conditions. A method of infiltration was developed by Reclus and Schleich. Goldscheider is credited with the discovery of conductive anesthesia, although it was first put into practice by Halsted. He succeeded in extracting teeth painlessly after an injection into the infra-orbital nerve from within the mouth. It soon became evident that this drug, cocaine, had many qualifications of an ideal anesthetic, yet, early on it was proven to be a dangerous substance if not handled with the greatest skill and caution. Foremost among the objections to its use were the following: (1) It could not be sterilized by boiling, (2) if boiled it lost its effectiveness as an anesthetic, and (3) it held in store a large measure of toxicity. Investigators in the medical world endeavored to remedy these defects, and the following preparation soon came on the market, viz.: tropacocain, eucain, holocain, stovain, and the orthoform group. The one preparation most in favor at the present time is novocain because of its low tonicity and its stability at high temperatures.

Dr. Potts points out two safeguards to be observed in the use of novocain, viz.: (1) "That as systemic effects varying from slight exhilaration to convulsions and coma depend upon its action upon the vital nerve centres of *concentrated solutions*, it behooves us to retard its absorption into the general circulation. This is best done about the head and face by combining varying proportions of the extract of suprarenal gland or its synthetic equivalent. That this does greatly retard absorption was amply demonstrated by Klapp."

The second safeguard is the use of *weaker solutions*. "I prefer," says Dr. Potts, "to dispense with percentage solutions and rely upon dosage. One-third of a grain has been given as a dose and is about one-seventh as toxic as cocaine. This estimation was made without the combination with suprarenal extracts, consequently much larger doses of novocaine, when combined with suprarenal extract, may be used. I have at times used as much as five or six-thirds without any evident toxic effects, one to three-thirds are, however, average doses."

By way of emphasizing the necessity for weak solutions of the anesthetic, Dr. Potts points out that these anesthetics are cell poisons having a special selective action upon nerve tissue, and should be used in as weak solution as possible in the varying conditions which call for their employment. The operator is reminded that "the element of time requisite to a perfect infiltration, together with other things with which we are not very familiar, not infrequently cause psychic shock, which is very frequently taken to be a manifestation of systemic poisoning; this can be obviated by quickly placing the patient in a recumbent position, or if necessary have the patient in this position before beginning."

It is possible that some unpleasant symptoms may arise through the injection of too large doses of suprarenal extract, viz.: rapid pulse, palpitation of the heart, air-hunger, dizziness, etc. Fortunately, these symptoms are momentary and need not be looked upon as serious. It is the author's opinion that "there is hardly an operation known to surgery which cannot be done under local anesthesia, conductive anesthesia, or a combination of both." Indeed, he thinks many operations can be done better by this means than is the case of general anesthesia because, "having the patient awake is a great advantage even though he be under an opiate. The bloodless field, due to suprarenal extract, is of inestimable advantage. Aspiration of foreign substances is obviated and the patient can expectorate. One can do more careful and painstaking work without the added danger of an anesthetic, and the position of the patient can be easily changed to suit conditions. In many instances hospital care and expense can be eliminated, and recovery from a general anesthetic, often arduous, is avoided. Operations upon the whole maxilla, nose, antrum and upper part of the face can be done under infiltration or in combination with conductive anesthesia. The second branch may be injected at the foramen rotundum or infra-orbital canal. In the mandible the combination is usually preferable and necessary back of the cuspids because of an extra innervation; the conductive anesthesia being induced by injection into one or both mental foramina or at one or both inferior dental foramina and locally as necessary."

The following general observations are made by Dr. Potts, viz.:

- (1) The more dense the gum and soft tissues are the more force and longer time for infiltration are required, (2) anesthesia in these cases:

will last longer, (3) more pain is caused when injecting into inflamed tissue and the anesthesia obtained is not so satisfactory as in the case of dense tissue, (4) conductive anesthesia by blocking the nerve trunks or infiltrating an area around but beyond the inflamed area is better in cases of inflamed tissue, (5) high blood pressure makes difficult the obtaining of prolonged anesthesia, because the anesthetic does not remain in the selected area long enough to effect a satisfactory combination with the nerve elements, (6) in the injection of bone, age plays an important role, and the success of the infiltration is dependent upon the foramina beneath the periosteum through which the anesthetic must pass. In youth these foramina are more plentiful, (7) for successful conductive anesthesia one must place the solution within the nerve sheath or around it, the latter being far more common, (8) for infiltration anesthesia the tissues must be saturated with the anesthetic solution, a small long needle having a short bevel being used. The injection is made slowly without bullae production, and the needle is advanced as the injection proceeds, also gently injecting as the needle is withdrawn. This is to be followed by gentle pressure over the area of infiltration, especially over the needle puncture.

It will have been observed, from the foregoing, that Dr. Potts would give preference to local anesthesia in a very large number of cases. Now this is in direct opposition to the opinion of many others, who have found that patients operated upon under local anesthesia suffer from nervous and mental shock for a considerably longer period than do those who have been wholly unconscious of the surgeon and his work, thanks to the beneficent effects of a general anesthesia. Basing an opinion upon the reports given us in our dental and medical journals, one might be safe in saying that of the two methods, the general anesthesia brings about the complete recovery of a patient more quickly; that is, of course, in cases where the operative procedure has to be prolonged.

CASTING GOLD INLAYS.

If one were asked to prepare a list of the subjects of supreme importance to dentists, that of casting would surely be thought of among the first. Casting is a part of our every day work and few of us are satisfied with the results obtained. Why is this the case? It might be suggested, by way of explanation, that we have not given enough consideration to principles underlying this process. They are the same for the cast denture as for the smallest cast inlay; but do we understand them?

It is with much interest, then, that we take up the paper by L. C. Burgard, D.D.S., published in December issue of *The Dental Review*, for herein he "analyzes the cause of the discrepancies that more or less present between marginal adaptation of a cast inlay as compared with the wax pattern." The author finds that the leading investigators of casting processes may be divided into two classes.

viz.: (1) Those who favor a method of casting into a heated mold, and (2) those who prefer to cast into a cold investment. The latter class is represented by Doctors Taggart and Ottolengui; the former by Doctors Price, Van Horn, Goslee and Ward. Whatever their differences of opinion may be, we know that they all obtain good results in following their particular method because they give attention to every detail of the technique. Perhaps we might be equally successful as they were we to be as painstaking in our methods. To obtain good results we ought to understand fully the characteristics of all the materials entering into the casting process, viz.: (1) Wax, (2) investing material, and (3) the metal to be casted.

Discussing the technique of volatilizing the wax from the mold, Dr. Burgard suggests that "to place the investment over an open flame of a Bunsen burner and gradually raise the heat is, at best, guess work. To properly volatilize a large inlay takes more time than does a small one, therefore each inlay being a law unto itself, timing methods are not practical." This is the method he prefers: He places the investment cup on an electric stove or iron plate over a Bunsen (the top of a flask is suggested) with sprue hole down. On tilting the cup from time to time, carbon smoke is seen to escape. At such time as no smoke escapes on tilting the cup, the case is in the most satisfactory condition for casting. At no time during the heating process does he use a heat greater than when the green investment was placed upon the stove or plate. After investing the case he allows it to stand about twenty minutes before applying heat.

The investing material should be in such a condition after the wax has all been volatilized that molten gold may be cast against it without causing a distortion of the mold. The author points out that if a casting is made before the wax is completely volatilized, such a casting is smooth, of a polished surface, but has rounded margins. If, on the other hand, we overheat our investment, such a casting is coated with silica and has sharp margins. The first class of inlay drops easily into a cavity of M.O.D. type, but the latter will not seat; the gold seems to have shrunken. An inlay cast into a mold where the wax has been properly volatilized "will seat to where it will bear close inspection."

A point for emphasis regarding investment material is that plaster of Paris being a binder in all investments, it loses its integrity when subjected to too great a heat, and when molten gold is cast against it there is disintegration, and an inlay is produced with decidedly imperfect margins.

A method for preventing the cast gold, in cases of large inlays, from going beyond the true mold lines, is suggested as follows: Burnish gold or platinum 1 : 1,000 or less to the cavity walls and on this build up the wax pattern. This pattern, with gold or platinum matrix attached, is invested the same as though for a whole wax pattern.

When the gold is cast upon this matrix there is less danger of the gold particles going beyond the true axial mold lines. It is questionable, however, that such a thin matrix could prevent all shrinkage, because the cast gold would most likely consume it as soon as they come in contact.

When investing the wax pattern, the wax is first coated with an even layer of thin investment, care being taken not to entrap any air. The sprue holder is then tapped gently so that the fine particles will settle closely and compactly around the pattern. The initial coating is done with very thin investment material, and it must be allowed to thicken before pouring in the balance of the mold, otherwise there will be insufficient resistance to withstand the force of the cast metal. An inlay cast into a mold of thin material comes out rough and distorted. The major part of the mold should be poured with material of a consistency like cold molasses.

A MIXING TEST FOR AMALGAM ALLOYS.

That it is possible for a dentist to judge of the merits or demerits of an alloy simply by a mixing test is the contention of Dr. P. A. Gould in his paper, "Mixing Test for a Good Alloy," published in *The Dental Summary*, October, 1916.

An alloy consisting of tin, 55%; and silver, 45%; takes up mercury very quickly. It exhibits a tendency to set quickly and makes a crackling sound (tin cry) when being mixed. If the surplus mercury is squeezed out the setting is hastened. This is a poor alloy on account of its tendency to shrinkage and flow.

If there is a little zinc in the alloy it will not mix as readily and a slight heat is noticed, also there is a tendency to quick setting. An alloy consisting, say, of silver, 45%; tin, 52%, and zinc, 3%, would exhibit these peculiarities. There may be much variation of shrinkage and expansion in an alloy of this type, and it would prove unsatisfactory as a filling material.

A good alloy is one consisting of silver, 65%; tin, 33%, and copper, 2%. When mixing this alloy, the mercury is taken up very quickly; it leaves a stain on the fingers and sets very quickly. If inserted with good pressure in a cavity a very satisfactory filling will result.

An alloy consisting of silver, 61½%; tin, 33½%, and zinc, 5%, is thought by the author to be the best alloy, aside from a gold alloy. When mixing in the hand no stain is noticeable. The mercury is taken up very quickly and it is medium setting.

A gold alloy, Dr. Gould thinks, is the best for dental use. He suggests the following formula: Gold, 5%; silver, 62%; tin, 33%. It is easy to mix, as it has a great affinity for mercury, sets very rapidly, and does not stain the hand.

DENTAL LITERATURE, 1916.

Many excellent contributions to dental literature have been made during the year just ended. There has been a marked tendency towards conservatism and thoroughness of judgment—qualities that are quite refreshing when we think of the exaggerated claims made for certain remedial agents, notably emetine, in last year's journals. More harm than good accrues through advertising methods of practice that have not been thoroughly tested out.

There is much evidence in this year's literature that the profession of dentistry has passed beyond the period of uncertainty and hypothesis, and is now assured of a future based upon careful and accurate deduction.

In the list of publications given below no attempt is made to furnish the reader with a complete index, but rather to point out representative papers in the various departments of dentistry. For purpose of reference, the name of the publisher of each paper or book is given.

PREVENTIVE DENTISTRY—

Preventive Dentistry, by Russell W. Bunting, D.D.Sc., (*Dental Review*).

Prevention of Dental Caries, by W. H. O. McGehee, D.D.S., M.D. (*Dental Summary*).

Conservation of Gum and Tooth Tissue, by Dr. Henry Barnes (*Dental Summary*).

OPERATIVE DENTISTRY—

Restoring Masticatory Function With Carved Gold Inlays, by Dr. R. Ottolengui (*Items of Interest*).

Factors of Importance in the Construction of Cast Gold Inlays, by Marcus L. Ward, D.D.S. (*Dental Cosmos*).

The Place of the Silicates in Dentistry, by Charles C. Voelker, D.D.S. (*Dental Summary*).

PYORRHEA ALVEOLARIS—

The Irrationality of Bacterial Vaccines in the Treatment of Pyorrhea Alveolaris, by Arthur H. Merrick, D.D.S. (*Dental Cosmos*).

Emetin in the Treatment of Peridental Suppuration, by Allen J. Smith, M.D., and M. T. Barrett, D.D.S., M.S. (*Dental Review*).

Pyorrhea, by A. Clifford Braly, D.D.S. (*Dental Summary*).

PROSTHESIS—

Masticating Efficiency in Natural and Artificial Teeth, by Alfred Gysi, D.D.S., and George W. Clapp, D.D.S. (*Dental Digest*).

Closed Mouth Impressions, by Samuel G. Supplee, D.D.S. (*Dental Digest*).

Some Problems in Mounting Artificial Dentures, by George H. Wilson, D.D.S. (*Dental Summary*).

The Design and Retention of Partial Dentures, by Dr. D. Gabell
(*Dental Cosmos*).

CROWN AND BRIDGE WORK—

The Shoulder Crown, by G. S. Hershey, D.D.S. (*Dental Summary*).

Crown and Bridge Work, by W. O. Hulick, D.D.S. (*Dental Summary*).

A Consideration of the Problems Involved in Removable Bridge Work, by Karl G. Knoche, D.D.S. (*Dental Review*).

METASTATIC INFECTIONS—

Dental Pathology and Its Relation to Systemic Disease, by T. A. Leonard, D.D.S. (*Dental Summary*).

Tonsil and Adenoid Pathology and Its Influence Upon Health and the Development of the Oral Cavity, by W. H. Clevenger, M.D., F.A.C.S. (*Dental Summary*).

ORAL SURGERY—

Ankylosis of the Jaw, by John B. Murphy (*Dental Cosmos*).

Root Resection and Apical Canal Filling After Resection, by C. D. Lucas, D.D.S. (*Dental Summary*).

LOCAL ANESTHESIA—

Conductive Anesthesia, by H. A. Potts, M.D., F.A.C.S. (*Dental Review*).

High Pressure Anesthesia for Cavity Preparation and Pulp Removal, by W. T. Jackman, D.D.S. (*Dental Summary*).

ROOT CANAL FILLINGS—

Root Canal Preparations, by J. R. Callahan, D.D.S. (*Dental Review*).

What Shall We Do With Pulpless Teeth? by Thos. Hartzell (*Dental Review*).

ORTHODONTIA—

A Further Study of Some Etiological Factors of Malocclusion, by Milo Hellman, D.D.S. (*Dental Cosmos*).

DENTAL EDUCATION—

The Problems of Dental Education in the Light of the Public Demand, by E. C. Kirk, D.D.S., Sc.D., LL.D.

BACTERIOLOGY—

Microbes and Dentists, by F. E. Stewart, Ph.G., M.D., Phar.D. (*Dental Summary*).

RADIOGRAPHY—

Radiographic Findings in Cases of Apical Infections, by Dr. F. D. Leach (*Dental Review*).

BOOKS—

Prosthetic Dentistry, by J. H. Prothero, D.D.S. (The Medico Dental Publishing Co., Chicago).

Oral Surgery, by Truman W. Brophy, M.D., D.D.S., LL.D., Sc.D., F.A.C.S. (P. Blakiston's Sons, Philadelphia).

Pathology and Bacteriology for Dental Students, by Guthrie McConnell, M.D. (W. B. Saunders Co., Philadelphia).

Alveolodental Pyorrhea, by Chas. C. Bass, M.D., and Foster M. Johns, M.D. (Saunders & Co., Philadelphia).

A Text Book of Operative Dentistry, by C. N. Johnson, M.A., L.D.S., D.D.S. (P. Blakiston's Sons, Philadelphia).

Mouth Hygiene, by Alfred C. Fones, D.D.S. (Lea & Febriger, Philadelphia).

Oral Hygiene Convention, Ontario Dental Society

N. S. COYNE, D.D.S., TORONTO.

THE annual conference of the Oral Hygiene Committee of the Ontario Dental Society was held in Toronto on November 21st.

After inspecting some new features at the Dental College, and later Orde Street school, the delegates were motored to the Board of Trade for luncheon.

The afternoon was spent inspecting the dental clinic and other interesting features of the military camp at the Exhibition Grounds, after which the delegates all met at the Walker House for dinner.

After dinner, Inspector Taylor, of St. Thomas, addressed the conference on "The Necessity of Dental Inspection in Rural Schools," emphasizing what, in his opinion, appeared to be some of the most feasible methods of introducing this reform.

The discussion on Inspector Taylor's address was opened by Dr. R. G. McLaughlin, followed by Inspector Denyes, of Milton; Inspector Smith, of Stratford; Dr. A. E. Webster, Dr. Wallace Secombe, Dr. W. E. Struthers, of Toronto, and others.

The following are the names of the men who were present at the convention:

Dr. E. H. Eidt, Stratford; Dr. T. C. Trigger, St. Thomas; Dr. William E. Struthers, Toronto; Dr. R. G. McLaughlin, Toronto; Dr. A. E. Webster, Toronto; Dr. R. J. Reade, Toronto; Inspector J. A. Taylor, M.A., St. Thomas; Dr. W. Cecil Trotter, Toronto; Dr. F. E. Bennett, St. Thomas; Dr. M. A. Ross Thomas, London; Dr. A. W. Ellis, Toronto; Dr. R. D. Thornton, Toronto; Dr. A. J. McDonagh, Toronto; Dr. N. S. Coyne, Toronto; Dr. Wallace Secombe, Toronto; Dr. H. E. Eaton, Toronto; Inspector J. Denyes, M.A., Milton; Dr. F. R. Watson, Georgetown; Dr. T. F. Perkin, Grand Valley; Dr. A. H. Mabee, Gananoque; Dr. O. Lillie, Westport; Dr. J. A. Bothwell, Stratford; Dr. C. A. Kennedy, Toronto; Dr. T. F. Campbell, Galt; Dr. R. M. Stewart, Markham; Dr. E. H. Wickware, Smith's Falls; Inspector J. H. Smith, M.A., Stratford; Inspector A. Mowat, M.A., Peterboro; Dr. R. W. Hoffman, Toronto; Dr. J. E. Middleton, Peterboro; Dr. M. A. Morrison, Peterboro; Dr. D. C. Smith, Stouffville; Dr. S. P. Reynolds, London; Dr. W. B. Amy, Toronto; Dr. J. F. Simpson, Trenton.

HORTICULTURE AS A HOBBY FOR THE DENTIST

FRED. G. BRETHOUR, D.D.S.
Spadina Ave. and College St., Toronto

ORAL HEALTH WILL BE PLEASED TO HEAR OF HORTICULTURAL
SUCCESSSES OR FAILURES AND OF YOUR GARDEN PLANS FOR THE
FUTURE. SUGGESTIONS OR QUERIES WILL BE GLADLY RECEIVED
FOR DISCUSSION IN SUBSEQUENT ISSUES.

Roses

I THINK we can safely say that every one loves the rose, the queen of flowers, and many would like to grow them. But few make the attempt as they think it is a most difficult undertaking. I must admit that even after I had a fair smattering of horticulture in general, and after reading various and sundry articles on roses in books and magazines, and wading through the innumerable classes and sub-classes and learning all about the flies, bugs, grub, worms, fungi, etc., that attack them, I said to myself: "Old man, you had better not try them. You will go out some morning and find nothing left of your roses but a few bare branches with the sharp thorns, and about a million of the above flies, bugs, etc., still looking for their breakfast." However, I bought a dozen or so of the cheap Dutch bushes from the nearest dealer and planted these with the utmost care. I pruned some of them to death, for I cut off the buds. Then I sprayed them all with liquid fire, German gas, and everything else; fed them with liquid manure, bone meal, sulphate of potash and pretty nearly everything but ice cream and cake, and even then had some fair blooms to cut. And so I decided to look into it and see if I could grow some really *choice* ones.

Now as this series of articles is for the beginner only, and not for the advanced amateur, I want to give a few simple directions on how to grow roses with average success and not be ashamed of the result. To give all the classes and sub-classes is very confusing and unnecessary, but bear in mind there are three classes that are most commonly grown: First, hybrid perpetuals or the June roses (they bloom once and are done for that year); second, hybrid teas or the monthly roses, which continue to bloom, and third, climbing roses. I would advise the beginner to grow the hybrid teas and climbers. However, there is one perpetual, the Frau Karl Druski, a magnificent white, which is in every collection, and which very often gives two crops of bloom.

Location.—Roses should not be planted in your perennial border. They are very exclusive and want a bed all to themselves. If you can arrange this bed so that they are shaded somewhat from the hot afternoon sun, so much the better, but they do not want any near shade, such as overhanging trees, board fences or high hedges. They must have an uninterrupted free current of air.

Soil.—Heavy clay loam is the best ground for roses. It must be trenched and manured in manner previously mentioned, with perhaps a heavier quantity of manure in the lower layers. Roses will grow in gravelly or sandy soil, too, but not quite so well.

How to Plant.—When you get your bushes put them in a tub of water over night if they have been long out of the ground. When you plant them do not expose the roots to the air—only one at a time when in the act of planting. You will notice in looking at the bush that the rose proper is grafted on to something else, either to briar or manetta. You will also notice that some of the roots are broken. Trim these with a sharp knife to a smooth end; that is, make a sharp cut above the fractured portion. Make the hole deep enough to allow the graft to be at least two inches below the level of the soil, and make it wide enough to allow for all the roots to be straightened out. Then firm the earth around each separate root in turn, and after putting three or four inches of soil in, press it down firmly with the foot. This is important. Add water if necessary and fill in rest of soil. Plant from eighteen inches to two feet apart.

Time to Plant.—Our roses, which are imported, reach here principally in spring and fall. The fall delivery is sometimes too late, but if bushes can be procured before the ground freezes I prefer fall planting, for the reason that the spring delivery is usually too late. However, most people plant them in the spring, and if you can get them in the ground in April you will have nice bloom in June. If you do not get them planted until late in May you will not get bloom until July.

How to Prune.—Do not prune any roses in the fall, except to cut off any very long branches that will swish around in the wind. Prune just as soon as you see the buds beginning to swell. Every bud means a branch and flowers, and it is the top bud which is the one you will get the flowers on first. It stands to reason that if you have too many buds you will have too many branches and too many leaves and the smaller and fewer will be the flowers. Examine your bush and if you see any branches shooting across through the centre cut them right out, as you need a nice open centre. Also cut off close any weak, sickly branches. Then follow down the branches and count the buds, and determine to leave only two, three or four buds, according to the strength of stem, and remember to leave the top bud pointing outwards. Take your pruning knife and make a vertical cut, starting about a quarter of an inch above the bud on



the outside. Do not injure the bark by partly stripping it, which would loosen the bud.

Climbing roses are pruned immediately after the flowers have withered. If you follow down a branch you will sometimes notice there is a nice strong new growth starting. Prune then down to that. If there is no growth on the old branch, cut down close to the ground, as there will be plenty of new growths coming up. If you do not understand this, get some good-natured neighbor to help you out.

How and When to Spray.—Provide yourself with a good strong sprayer with a curved nozzle. Before the leaves come out at all spray once with Bordeaux mixture, which you may get prepared. Then buy Abol Solution and use it according to directions. The hose, along with these, are about all you need. There is one little worm about half an inch long, and green, which your sprays won't kill. He is a very busy little fellow and works at night. If he gets into your rosebud it is "good-night" for that flower, and the number he eats is remarkable. You will find him rolled up in a leaf and sleeping in the daytime. When you see a leaf stuck together just give it a squeeze with your thumb and first finger. That is the best way to get rid of him. The green Aphis is the second most bother-

some thing—those little flies that increase from one pair to about a million in a few days. Abol is good for them, washing them off with the hose is also good, and crushing them with your fingers every time you see one helps also. If you stick up two or three little wren houses near your rose-bed these little birds will help to keep your bushes free from worms, as they are hunting for them all day long, and they are jolly little fellows, for they are singing all the time. The little lady bug also is a helper—she lives on the Aphis. Get the children interested in looking for these pests. I gave my little girl a cent for every worm she found, and she would make twenty or twenty-five cents before breakfast. Their sharp little eyes don't miss many.

Fertilizers.—For the first year depend solely on liquid manure if you use a fertilizer, and it can be used fairly strong. You can use chemical fertilizer the second year, but the well-rotted manures are the best.

Winter Protection.—Hybrid tea roses will stand quite a few degrees of frost, but the winters are too severe and will kill them in this locality unless they are protected. Perhaps it is the thawing and freezing of early spring which does the most harm, for I am told that roses winter well without protection in Muskoka. That is because there is a good fall of snow there and it remains until well on in the spring. The best method to pursue is to heel up your rose bushes by drawing the earth up around them to a height of six or eight inches just before you think it is going to freeze up. This usually occurs about the end of November. Then after the ground has frozen up hard put a good heavy covering of loose strawy manure over this again. Only the tops of the branches will be exposed, which will of course freeze up. These are pruned off in the spring anyway. Take the cover off gradually in the spring, and do not uncover completely much before the second week in April. Your object is not to keep the bushes from freezing, but to keep the frost in so that the first warm day in spring will not start premature growth.

As for the climbers, train them on your trellis so that they can be laid down and covered with four or five inches of earth. This is an absolutely safe way of handling them. When you uncover them about the second week in April you will see perhaps a half-inch of growth.

Varieties.—The following are some of the standard varieties that are in nearly every collection, and you will find them around the top when it comes to exhibition. There are dozens of new varieties coming out every year, and your enthusiasm will lead you to get some of these every season. These are all hybrid teas: La France, silvery rose; Lyons, salmon pink; Caroline Testout, bright rose; Madame Ed. Herriott, glorified Lyons; Madame Abel Chatenay, bright salmon pink; Gruss an Teplitz, crimson, in clusters; General McArthur, crimson; Hadley, bright red; Madame Ravary, yellow; Duchess of

Wellington, yellow; Lady Alice Stanley, deep coral rose; Madame Melanie Soupert, salmon yellow; Kaiserin Augusta Victoria, white; Irish Elegance, single, orange scarlet; Bessie Brown, creamy white; Joseph Hill, pink salmon shaded; Edith Part, red suffused salmon and coppery yellow; Mrs. Charles E. Pearson, salmon pink; Climbers, American Pillar; Tausendschon; Hiawatha; Pauls Scarlet Climber (new).

Where to Buy Your Roses.—Roses are usually sold grafted on briar or on manetta or growing on their own roots. Those grown on briar seem to give the best satisfaction, and the best of them come from England and Ireland, from such growers as Hugh Dickson, Royal Nurseries, Belfast; Samuel McGredy & Son, Portadown, Ireland; H. Merryweather & Sons, Southwell, Notts, England; King's Acre Nurseries, Hereford; Alex. Dickson.

Merryweather, Dickson and McGredy have all representatives in Toronto, and you can buy roses from thirty to forty-five cents a piece from them, which is as cheap as you can import them yourself. You are quite safe in buying anything from above growers.

[Note.—The articles in following numbers will deal with some of the choice perennials—chiefly those which may be satisfactorily grown from seeds, in seed-flats in your house. So if you wish to try these out get some good clay loam, well-rotted manure, leaf mould and coarse sand into your cellar.]

Marked Prevalence of Syphilitic Lesions

ADDRESS DELIVERED BY DR. C. K. CLARKE BEFORE THE ORAL
HYGIENE CONVENTION OF THE ONTARIO
DENTAL SOCIETY.

IMPORTANT research work has been recently undertaken at the Toronto General Hospital out-patient department in establishing most serious facts regarding the frequency and pernicious results of syphilis.

Dr. C. K. Clarke, Superintendent of the Hospital and Dean of the Medical Faculty, in addressing a meeting of the Oral Hygiene Convention of the Ontario Dental Society, referred to the dentist as the most important man in the community, hospital experience showing conclusively the importance of the teeth and necessity for the closest relationship between dentistry and medicine. Co-operation between dentist and physician was declared to be of particular necessity in syphilitic cases because of the frequency of secondary infection in the mouth, in the form of mucous patches. Spirochetes, when taken from the mouth, are of the most virulent type. The dentist should be most careful regarding sterilization, infection being frequently innocently acquired.

Special observation of syphilitic cases at the hospital originated in the feeble-minded clinic, where a very high percentage of patients were found with syphilitic taint. This led to the establishment of a specific clinic, which is operated both day and night, thus being available to the working classes. Conditions discovered were a shock to the authorities. From seventy to eighty patients presented themselves each day for treatment. Some of these, of course, were "repeats" and all received mercurial treatment. These conditions led the hospital authorities to go farther and gather data from all sources. A Wasserman test was made of every patient who presented at the hospital, and the alarming fact was established that over 12 per cent. of patients had syphilis in one form or another. These facts have been absolutely proven. Over 25 per cent. of patients in the asylum for the insane, Toronto, were admitted because of this cause, resulting in paranoia.

These facts, said Dr. Clarke, unpleasant as they are, must be faced. Why not approach the subject systematically and scientifically, as in tuberculosis? Social service nurses can undoubtedly be of great help, but the law should go farther and enact legislation providing for registration, such as now prevails in Australia. Under such a system all patients are registered and are known by number so long as treatments and instructions are followed, but when a patient fails to follow up the prescribed treatment, the name of the individual is divulged as being a menace to the health of the community.

Dr. Clarke stated that application is to be made to the Canadian Conservation Commission and the inauguration of registration urged. Dentists were asked to note all cases in practice and refer same to proper authorities.

Since the war it has been impossible to procure salvarsan, which is largely used in treatment of these cases, but fortunately two young Canadian chemists have discovered and produced a Canadian product that is in every way satisfactory as a substitute for salvarsan.

How the C.A.D.C. Conducts Prosthetic Work

IN a letter to Major W. G. Thompson, A.D.D.S., M.D. No. 2, Captain George Wilcox describes in detail the plan of work of the Canadian Army Dental Corps overseas: "Perhaps a little information on our system here at East Sandling might interest you. In the first place all drafts are paraded to the clinic and examined shortly after arriving. All men needing dental treatment are then put in a separate company called the Dental Company, and are placed on duty within the lines, so that we can call on them at any time. We have five battalions here, and consequently have a day for each one. The men in the Dental Company are then classified as follows:

- “(1) Men who will be fit with extraction only.
- “(2) Men who will be fit with or without extraction and denture.
- “(3) Men who will be fit with extraction and one or two fillings.
- “(4) Men who will be fit with or without extraction and several fillings.

“We then proceed to make fit as many as possible of those who require very little work. That gives the militia a number of fit men at once. Then we do extraction for those who will need dentures and the rest of the work follows along in order. Of course this could not be done in Canada, but with us the battalions and companies are split up continually and it is comparatively easy. This system proves most satisfactory.

“Now, in the laboratory, when I tell you that six qualified sergeants with four inexperienced men, turned out in October 365 dentures and in November 383 dentures, you will be inclined to wonder if I always speak the truth. But they surely did, and it was owing to the system. One batman has been taught to run models. We take the impression and send them to the laboratory, where they are run immediately. In the meantime we have the patient wait in the ante-room and have him in again when the models are returned. We then take the bite, cool it and trim it down. Place it back in the mouth to be sure it is perfect, and then fit the bite to the model ourselves. The bite, with model fitted, goes to the laboratory and is put on an articulator by this same man. The sergeants then set up the case and the flasking and packing is done by one sergeant, while a batman boils them out. They are then filed to proper shape by a sergeant and sandpapered and finished by batmen. With this system in the laboratory, and us fitting the bites ourselves, we are able to turn out an enormous number of dentures per man, and the results are fairly accurate, many needing no grinding whatever.”

The Growth of Orthodontia

BY R. ANEMA, T.M., D.D.S., CH.D., PARIS.

[An extract from the address of the President of the European Orthodontia Society as published in *Dental Cosmos*.]

WE wish to mention a very encouraging feature, namely, the powerful influence that the principle of “normal occlusion” has had since it was first propounded on men given to scientific research work and on dental surgery. A colleague of ours has lately, in an interesting article, called attention to this influence, therefore we shall not go into unnecessary details. The American orthodontist will also be remembered who recently awakened the dental profession to the great utility of the anatomically correct carved inlay. It was this orthodontist surgeon who most emphatically called

the attention of dental surgeons to the great value of these finer anatomical inlays, with their beautiful *finesse* of occlusal fissures and of exact approximate contours, restoring as well the cusps and sulci in their every detail for the purpose of keeping the normal position of the dentition intact once the malocclusion is cured.

The efforts of the orthodontic surgeons as appreciated by rhinologists and by other members of the healing art, including many dental surgeons, represent, we believe it may be said in all modesty, a service rendered to the healing art in general and to dental surgery in special. May orthodontia in return ask a favor of the illustrious representatives of different sections of the healing art here present? If so, it is this, that all practitioners, European as well as American here present to-day, shall use their influence to discountenance most emphatically in their several countries the injudicious extraction of teeth, much of which, it is our firm conviction, is still practised in all countries. To begin with, we request you to combat the extraction of teeth in the deciduous set from a prophylactic point of view, in order to prevent malocclusion in the permanent set. We will here call to mind but one feature of the bad effect produced by the extraction of deciduous teeth; we refer to the premature extraction of the deciduous molars. We would call up the picture of the permanent first molar pushed up toward the front part of the mouth, with the incisors, etc., in front of it falling back toward the permanent first molar, so that the space previously occupied by the deciduous molars becomes obliterated, or partly so, with all the evil effects on the future growth of the permanent teeth and the jaws in which these teeth are implanted. If we may be allowed to ask something more, then we request you to advocate in your environment the practice of the same beautiful carved inlay or its equivalent, not only in the permanent set just spoken of, but also and especially in the deciduous set. This extension of the application of the "non-extraction doctrine" according to the principle of *restitutio ad integrum* of the dental organ applied also to the temporary dentition will prevent many cases of malocclusion in the permanent set. Insufficiently contoured occlusal fillings in the deciduous teeth are, in our opinion, the cause of a considerable number of cases of malocclusion in the permanent set.

"Muscle Trimming" an Impression

ONE of the graduates of the Cummer Post-graduate Course had an amusing incident in practice a short time ago. The operator explained to the patient the difference between the Gysi system and the old method, and then explained "muscle trimming." The patient returned a few days later and volunteered the information that her physician thought that if she was going to have a "muscle trimmed impression" she should go to the hospital and have it done properly by a regular surgeon and not by a dentist.

MULTUM IN PARVO

This Department is Edited by
C. A. KENNEDY, D.D.S., 2 College Street, Toronto

HELPFUL PRACTICAL SUGGESTIONS FOR PUBLICATION, SENT IN BY MEMBERS OF THE PROFESSION, WILL BE APPRECIATED BY THIS DEPARTMENT

ARTICULATING PASTE.—A very useful articulating paste for dentures consists in a thick mixture of ivory-black and glycerine. The opposing surfaces are perfectly dried, and a small quantity of the paste is applied to the occluding tooth. On closing the teeth together the contact point becomes plainly visible.—*Zahnaerztliche Rundschau*.

MAKING WAXED SILK.—A ball of silk twist or silkateen, as purchased in any dry goods store, is placed in a cup with sufficient melted beeswax to cover the ball. The thread is boiled in the wax for one minute, removed and allowed to cool, ready for use.—*C. I. Faison, Dental Digest*.

A GOOD TEASER FOR SOLDER.—A stiff piece of wire is bent at one end so as to form a handle; on the other end the graphite removed from a sharpened lead pencil is fastened with small binding wire. With this, melted gold or solder can be teased to the desired position without adhering to the teaser.—*C. I. Faison, Dental Digest*.

TIGHTENING THE LID OF A VULCANIZER.—The rubber ring of the vulcanizer is sprinkled with powdered meerschaum, the lid replaced, and the screw tightened at first lightly, then more firmly as the boiling point is reached.—*Zahnaerztliche Rundschau*.

REMOVAL OF RUST FROM INSTRUMENTS.—The rusted instruments are laid in a solution of tin chloride (preferably hot), and afterward rinsed in clear water. Abrasives remove the polish.—*E. D. Spears, Journal American Medical Association*.

REMOVING TIN FOIL FROM VULCANITE PLATES.—Small particles of tin foil adhering to vulcanite plates can be easily removed by mixing mercury with enough alloy to keep it from flowing, and rubbing this mixture over the plate.—*Pacific Dental Gazette*.

SILVER NITRATE AS A HEMOSTATIC.—In cases of irritating hemorrhage at the gum margins in filling cavities which are close to the margin, a light touch with silver nitrate crystals will make a comfortable field for working. It is also useful in stopping persistent capillary hemorrhage after extraction.—*Commonwealth Dental Review*.

TO INTENSIFY HEAT OF BLOWPIPE.—The heat of a gasoline blow pipe may be intensified by adding a small amount of ether to the gasoline.—*C. E. Fellman, Gold Nuggets*.

ACTIVE SERVICE ROLL

Complimentary copies of ORAL HEALTH will be sent during the progress of the war to all Dental Graduates on active service whose army address is known.

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†Director of Dental Services, address Folkestone. ‡Director of Dental Services, address Ottawa. *Lieutenants rank as Captains while overseas. C.A.D.C. overseas address—care of Director Dental Services, Canadian Contingents, 23 Earls Ave., Folkestone, England.

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Vol. VII.

TORONTO, JANUARY, 1917

No. 1

EDITORIAL

The Medicated Dentifrice

UNDER no circumstances should the dental profession acquiesce in the general use of highly medicated tooth cleansing preparations. There is, doubtless, a place for the medicated dentifrice in the treatment of diseased conditions of the soft tissues of the mouth or abnormal conditions of the oral fluids. A medicated dentifrice, however, should be used only upon recommendation of a dentist and as part of the prescribed treatment in specific cases.

We have surely passed the patent-medicine cure-all stage in the diagnosis and treatment of dental disease. Manufacturers may safely leave these matters in the hands of the practising dentist. The natural inference to be drawn from the press announcement of some dentifrice manufacturers, leads the average citizen to the conclusion that all the dental ills of humanity have a common origin in precisely similar conditions, that these conditions are invariably found in every mouth, and that there is but one perfect cure and preventative,—namely, the particular dentifrice in whose interest the advertisement appears. Dentists cannot recognize and certainly should not tolerate such nonsense. Diseased conditions of the teeth and investing tissues should be diagnosed and treated by the dentist. If the use of a medicated

dentifrice is advisable the dentist will recommend it and not otherwise.

The time has certainly come when dentifrice manufacturers must be divided into two groups: The one composed of those manufacturing a simple, pleasant cleansing agent, and the other, those manufacturing a cleansing agent with strong drugs added. The former may properly appeal directly to the general public for support, while the latter should confine their publicity effort entirely, to a presentation of their claims to the dental profession.

Those of the latter group of manufacturers who have been appealing to the public, are most versatile in discovering the cause of dental disease. They ingeniously add one disease or condition after another, to the already long list of conditions "cured" by the use of their particular dentifrice. They remind one of an Indian Chieftain adding scalps to his belt. The whole matter is a serious business, though it is amusing to watch the alacrity with which the above members of the "medicated group" follow a lead. One manufacturer adds Chlorate of Potash, and in a twinkling the others follow suit,—not that they believe that potassium chlorate is a good thing to add, but simply because they feel that without that particular drug they are at a disadvantage, and the other fellow may score. A little later the same spectacle was repeated with Emetine. One manufacturer claims that his dentifrice, when used in the mouth, is a germicide (though he must know that if his claim is true the preparation is doing more damage to the mucous membrane of the mouth than to the micro-organism), while the next man claims "germicidal efficiency," and, "if used regularly will prevent colds." How long is the dental profession going to suffer without protest, this vicious contest of cure added to cure and drug added to drug? Why should there be introduced into the oral cavity of the average healthy man, each time he cleans his mouth, drugs which only destroy or deteriorate the function of the tissue cells, and fail entirely to exercise a beneficent effect, the conditions indicating their use being entirely absent?

One manufacturer attempts to substantiate his germicide claim, by presenting an Analytical Laboratory Report. "We found," says the report, "that five minutes exposure to a 10 per cent. solution of your tooth paste was sufficient to destroy the *Staphylococcus Pyogenes Aureus* entirely. These results therefore indicate 1000 per cent. germicidal effect produced by a 10 per cent. solution." How can such an experiment, performed in a test tube in the laboratory, honestly compare with results in the oral cavity, with its constantly flowing saliva? One might as well compare the sterilization of quiescent water in a tub by the addition of Phenol, with the result of an equal quantity of the drug thrown into the River Niagara. As a matter of fact it is the flowing saliva that saves the situation for many of the medicated dentifrices. For the ordinary individual with a healthy mouth, all that is needed is a cleansing agent.

Horticulture for the Dentist

ORAL HEALTH is glad to learn from no less an authority than the President of the Ontario Horticultural Association that members of the dental profession appreciate Dr. Brethour's articles upon the subject of Horticulture. We are glad to publish the following letter, and to offer our congratulations to Dr. Frank Bennett upon his election to the important position of President of the Ontario Horticultural Society, and re-election to the Presidency of the St. Thomas Horticultural Society for the eighth consecutive year:

St. Thomas, Ont., November 28th, 1916.

Dr. Wallace Seccombe,
Editor ORAL HEALTH,
Toronto.

Dear Doctor Seccombe:

Allow me to express my appreciation of the articles on Horticulture by Dr. Brethour which have been appearing in recent issues of ORAL HEALTH. I know of no other hobby by which one can do so much good to himself (if you wish to put yourself first) and so much good to mankind. Of course, in the latter case, is where you get the real joy. What one puts into this world is what you get out of it. The refining influence of flowers cannot be estimated by dollars and cents. A child reared in a community that believes in the beautiful and practises that belief, cannot go far astray. Therefore, flowers are not a luxury, but an absolute necessity.

I know that Dr. Brethour's articles will accomplish great good, so keep up the good work. As President of the Ontario Horticultural Association, I shall be glad to give my fellow-practitioners any aid that is within my power.

Yours sincerely,

FRANK E. BENNETT.

Lt.-Col. Gow Mentioned in Despatches

ALONG with a number of Canadian medical service men, Lt.-Col. George Gow, Dental Surgeon, C.A.D.C., has been mentioned in dispatches in connection with the Salonika operations. The names of Lt.-Col. Gow and Capt. Mallory never fail to be associated with the reports of the grand work of No. 4 University of Toronto Base Hospital at Salonika.

Personal

Dr. O. I. Cunningham has been returned at the head of his district as member of the London, Ont., City Council. Congratulations, Dr. Cunningham.

The Right Honorable Sir Robert
Borden, Premier of Canada,
Pays Tribute to the Work
of the Canadian Army
Dental Corps

THE following is an extract from Hansard of Monday, January 22, 1917, of Sir Robert Borden's address in reply to the Governor-General's speech:

"I was speaking of the great organization necessary in connection with so large a force as that which Canada is maintaining in this war. I omitted a reference to the Canadian Dental Service which, as I am informed by the authorities of the Department of Militia and Defence, has made it possible for about fifty thousand Canadians to pass the examination and to enter military service who otherwise might have been unable—probably would have been unable—to do so. Canada was one of the first countries in the world to establish this service, and the results which have been obtained are eminently satisfactory in every way."



MAJOR T. C. BRUCE, A.D.D.S., M.D. No. 13
Canadian Army Dental Corps

ORAL HEALTH

A JOURNAL THAT STANDS FOR THE "OUNCE OF PREVENTION," AS WELL AS THE "POUND OF CURE"

VOL. 7

TORONTO, FEBRUARY 1917

No. 2

Oral Hygiene in the Rural School*

J. A. TAYLOR, B.A., PUBLIC SCHOOL INSPECTOR, CITY OF ST. THOMAS AND DISTRICT NO. 2, ELGIN.

I CERTAINLY appreciate the honor you have conferred on me of asking me to address a body of intelligent men, such as I see before me to-night. It is a singular pleasure, too, because there is no body of professional men who hold in the hollow of their hands the physical destiny of the human race more than does the dental profession. I am also pleased to have the pleasure of meeting and dining with my old schoolmate, Dr. Struthers, whom I see wearing the uniform of the King to-night, who has done so much for matters educational in this great city, and whose pre-eminent claim to immortality lies in the enduring monument he has reared in an efficient system of dental and medical inspection of the schools in this city. I am also reminded by the presence of other gentlemen in khaki that many members of your profession have joined the colors. In the midst of disquieting circumstances under which we meet we are consoled by the fact that the great principles for which we are fighting—the principles of righteousness, justice, equity and truth—have had their birth and their genesis at the throne of God; and because we have an implicit faith that these principles are more highly developed in the British Empire than in any other nation we believe in the final triumph of the British race.

Now, gentlemen, there never was a time when it could be more truly said that the only asset any nation had was its children, and there never was a time when it was the paramount duty of the state to preserve its greatest and only asset as now. Humanity is appalled

*An address delivered before the Oral Hygiene Convention of the Ontario Dental Society, Toronto, 21 November, 1916.

at the incalculable losses in the trenches. Even to-day such is the premium placed on childhood that there is an effort in some direction to legitimize polygamy. The casualty lists, as published, mention the loss of over twelve thousand Canadian dead and fifty thousand wounded. It would be a reasonable inference to assume that at least one-half of these, had they lived, would have established homes and would have been the heads of families. If, then, this be true, how fundamentally necessary it is to safeguard the health of the children of to-day, who are to be the citizens of to-morrow? It was Kitchener who said, "That the last hundred thousand men would win the war." To-day we are bending the energies of the state to get recruits, and we have already refused as medically unfit over one hundred thousand men who had volunteered for the trenches. Had these men been given medical and dental attention in the school room ten or fifteen years ago a very large number would be to-day in uniform. How much cheaper, too, it would have been to have removed the physical defects then and had them capable of defending the state now in this, the tragic hour, of the Empire's supreme crisis.

"In times of war prepare for peace," is a wise saying. In the tremendous economic, commercial and industrial struggle that is to follow in the wake of this war, our children, not we, will be the competitors. How incumbent on us, who are charged with their education, to see that every physical defect and disability is removed, so that when this colossal struggle comes they will not be the hewers of wood and the drawers of water for others. It is possible, too, making allowance for the human equation, the accidents and exigencies of war that there might be such a thing as a drawn peace. In such a case there would be a reversion to primitive times, when woman looked after the industrial and man the defensive part of the state. This emphasized once more the absolute claim of the children of to-day for the removal by the state of any physical disability that might hinder their physical and mental development. The safety of the state is the highest law and is the supreme duty of every man. The degree of safety and the efficiency of its defence bear a direct proportion to the physical and mental conditions of its citizens.

This raises the question whether dental and medical inspection in the schools is necessary. Assuming that there are two classes of schools, the rural and urban, I quote you statistics of two inspections. In North Middlesex, which is typical of most rural inspectorates as regards local conditions, etc., we find that out of 821 pupils examined 161 had enlarged tonsils, 82 impaired nasal breathing and adenoids, 94 had defective vision, 295 were afflicted with caries, and 73 had anaemia; that is, 705 or 90 per cent. were incapacitated by reason of physical remedial defects from assimilating and appropriating the education which, at great expense, was placed before them. Again, in Toronto, which is typical of most urban centres, we find

that out of 894 pupils examined, 243 were mouth breathers, 384 had decayed teeth, 249 were troubled with enlarged glands, 269 had pus exuding into the mouth, 288 had constant toothache, and 851 required dental treatment. From the above we see how terribly handicapped such children are in securing even an average education. Impaired vision and hearing means impaired ability to get knowledge. It is found, too, that the great majority of children who suffer from physical disability are from one to five years behind other children of their age in their studies. Thus the average of human intelligence and the average efficiency of the state are lowered. These children swell the ranks of the backward pupils, congest the classes, delay progress, augment the ranks of the vicious, the criminal and the immoral. From careful analysis it is estimated that at least 95 per cent. of all children are afflicted with oral sepsis, which is the cause in most cases, doctors tell us, of indigestion, dyspepsia, gastritis, infected parotid glands, tuberculosis of the lymph glands, anaemia and nephritis. A healthy mouth, with good teeth, means proper mastication; good mastication ensures satisfactory salivation; copious salivation produces improved assimilation and nutrition. Only last week some speaker said at Hamilton, that out of four thousand applicants for positions in the railway shops, only 164 had the necessary physical physique to qualify—3,836 were consigned to the human scrap heap.

Then, too, there is an ever-increasing number of mental degenerates, whose presence in school is prejudicial to the mental and moral interests of the other pupils. To these mental degenerates and physical weaklings—the product of bad heredity—will be added many emigrants from pauperized Europe after the war is over.

It seems to me that now is the most opportune time to begin the propaganda for rural medical and dental inspection. As a means of promoting this I would suggest:

(a) The more extensive use of the daily press, magazines and periodicals. This is the greatest lever at our control for awakening public opinion in favor of human preservation and human conservation. The great dailies, with provincial circulation, have brought about marvellous changes in public sentiment regarding the desirability of introducing agricultural teaching in our public schools.

(b) There should be hearty co-operation between the inspectors and this oral institute. I am glad to see a few of them present to-night, for there is no body of men more in touch with the needs of the schools, or who are more responsive to the introduction of intelligent methods for attaining greater proficiency amongst the scholars and higher efficiency among the teachers than they. They are intermediate between the ratepayer on the one hand and the teachers on the other. It is they to whom the trustees go for advice. With a view to securing unity of action and co-operation in this worthy under-

taking, I would suggest that every effort be made to have them present in large numbers at your annual meeting next year.

(d) Opportunity should be sought for most eminent educators to address the inspectors, teachers and trustees at their convention in April. Securing the endorsement, approval and co-operation of these bodies would be a great advertisement for the introduction of medical and dental inspection in our schools.

(e) A place on the programme of each county teachers' convention could be requested for some officers of this institute. A very powerful and exhaustive address on school hygiene was given at one of our last teachers' conventions by Dr. Wallace Secombe, of Toronto. Since then more attention has been given to hygiene by our teachers than ever before. The endorsing of the movement by the various institutes would direct public attention to the necessity of the innovation.

(f) Addresses bearing on the subject could be given by local men at the Women's Clubs, Farmers' Institutes and County Trustees' Association. In this way the commonwealth could be enlightened as to the advantages that might be looked for through the introduction of school clinics.

(g) As the ultimate end sought is increased efficiency in the arts, sciences, industrial and commercial pursuits, military equipment and public service, the Government might be approached to make an appropriation for the propaganda.

Notwithstanding the present awful conflict that is being waged on the European battlefields, and notwithstanding the vast sums our people are contributing in their colossal struggle for the Empire, civilization and humanity, the progress of education must continue uninterrupted. It is universally admitted that it is the children who to-day are being educated that must meet the conditions, commercial, industrial and economic, that will inevitably follow in the wake of this titanic struggle. The children of to-day are the citizens of to-morrow and the trustees of posterity. They are the most precious of our possessions. Their assistance is necessary in industry, commerce, exploration, discovery and invention, and no legitimate effort can be withheld, nor expense curtailed, to develop in them the highest character and the greatest efficiency in their physical, æsthetic, intellectual and ethical education.

Now, Mr. Chairman, I have already spoken too long; my notes are ended. Our course is clear and our cause is just. Ere I close I can only remind you that away out yonder on the battlefields of France, and the trenches of Flanders, our brothers and our sons are dying in order that human civilization may not perish and that the British Empire may live; so we who are left at home must fight a foe equally insidious in the battlefields of the human body and the trenches of the human mouth.

They never die who die in a great cause;
The block may soak their gore; their heads may sodden in the sun;
They but augment that sweeping stream that leads the world at last
to freedom.

Discussion of Inspector Taylor's Address

R. G. McLAUGHLIN, D.D.S., TORONTO.

MY discussion of this subject must of necessity be very brief, and I think it ought to be so, as there are many at this meeting, both inside the dental profession and outside the profession, who should be heard from in this gathering.

I want, in the first place, to express my appreciation of the important discourse that we have been privileged to listen to from our honored guest of the evening. I appreciated this eloquent address for two reasons: In the first place, because of its intrinsic value. It certainly will be a valuable contribution to the campaign which we are waging on behalf of the school children of our province. And in the second place, I appreciate it because it comes from a man, although outside the profession, yet occupies, amongst others, an influential position in the education circles of our province.

I cannot discuss the address of Inspector Taylor in all its details, as I was not privileged to have any particular intimation of the line of thought he intended to follow, but rather I will attempt to supplement the words he has already spoken.

In the first place, I take it, there is no occasion to speak of the need of oral hygiene being taught and practised in the public schools of our country. Inspector Taylor has already dealt, at considerable length, on that particular phase of the subject, and if anything further were needed to impress us on this particular point it was surely furnished by the recent visit of Dr. Moorehead, of Chicago, to the Toronto Dental Society. Dr. Moorehead summed up the whole matter of the menace to the general system arising from a diseased and defective mouth in this way. He said that the danger sources in the oral cavity, so far as infection is concerned, could be narrowed down to two, namely, the alveolar abscess and pyorrhea alveolaris. He proved most convincingly that any individual in whose mouth there was either of these two lesions was in the danger zone so far as his future health was concerned. It would seem, then, that the only one who is safe from diseases arising from a septic condition of the oral cavity would be those whose teeth are and always have been in a sound and healthy condition. That, Mr. Chairman, surely lays upon us of the oral hygiene movement the responsibility of seeing to it that the children of our public schools shall grow up with sound

and healthy conditions in the oral cavity.

Let us see for a moment just what progress we have made in Ontario in the campaign for oral health.

We have made considerable progress, in fact a good deal of progress, in our own city of Toronto, where the work has been undertaken and carried on with phenomenal success. According to the report of Dr. Seccombe, Chief Dental Officer of School Dental Clinics, the number of defective teeth among the children in Toronto schools has been reduced from 95 per cent. to 51 per cent. That shows, Mr. Chairman, that the work, when undertaken systematically, will bring definite results.

Also the campaign has made considerable progress in many other cities and towns of our province. But in the country districts, away out beyond even the smaller villages—in this district to which our attention is particularly directed at the present time—little or nothing has been attempted in the way of caring for the teeth of the children in the public schools. We know there are difficulties attending this campaign that are peculiar to the country districts, owing to the scattered condition of the population and the fact that the school buildings are far separated one from another. But even with these difficulties confronting us there is absolutely no reason why there should not be undertaken a campaign for dental inspection and dental education. If this campaign is to be undertaken, then it is certain that the existing machinery should be considerably amended and improved. The regulations, as issued a year or two ago by the Education Department at Queen's Park, are entirely inadequate to the needs of the situation. Let me refer you to the first clause of these regulations. It reads in this way: "Where provision has been made for the free treatment of the teeth of pupils whose parents or guardians are unable to pay therefor, one school board or a number of school boards, acting either by themselves or in conjunction with other local associations approved for this purpose by the Minister may, by resolution, adopt a system of school dental inspection."

That first clause, Mr. Chairman, practically destroyed the usefulness of the whole series of regulations as sent out by the Minister of Education. We all know that it is practically impossible to establish school dental clinics in the country districts, and again, if it were possible, it is entirely unnecessary. There are very few poor families among the farmers in the Province of Ontario to-day, so I say it is not only impracticable, but it is unnecessary.

In the second place the Education Department, in that first clause, leaves it to the option of the individual school boards whether they do anything in this matter or not. Now those of us who know anything of school trustee boards in the country districts know that they are very prone to take upon themselves any further responsibility or expense than is absolutely necessary, so we need not read any further

in those regulations than the first clause to see that these regulations are entirely, as I have said, inadequate to meet the needs of the situation.

Now what is wanted is that the matter of dental inspection and dental education, either by themselves or in conjunction with medical inspection, should be made compulsory in every public school of the Province of Ontario, and if the Education Department is to be influenced to that end, then it will be necessary for not only the dental profession to take this matter up, but that they have the hearty co-operation of the school inspectors, the trustees, the teachers and the Women's Institutes of the whole province. I feel satisfied if these bodies would unite and appoint a deputation to bring this matter in a practical way before the Minister of Education it would receive the most favorable consideration. But there must be a definite plan in the hands of the deputation before it appears before the Minister of Education, and I think such a plan can be readily formulated.

A dental inspector should be appointed for each county in the province. Such an appointment should not meet with any more difficulties or be any more expense to the country than one of the inspectors already acting in the inspection of subjects of an academic nature. He could visit a school in the country district, make an examination of the children's teeth, make out his report, have that report sent, through the medium of the pupils, to the parents and guardians all in one day. Also the same evening he might call a meeting of the citizens of the school district and deliver in that school house an illustrated lecture on oral hygiene. There is no difficulty in such an inspector carrying with him a sufficient number of suitable slides and a lantern so that a lecture of that nature would not only be decidedly useful, but would prove, no doubt, popular to the parents and guardians of those children. I believe, Mr. Chairman, that a visit of that kind would meet with the most hearty response, and that, if advertised properly, the meeting in the evening would fill the local school house to the very door.

Thus the dental inspector would not only inspect the children's teeth and report the condition to the parents and teachers, but would also prove a very strong feature in instructing children and parents in the proper care of the oral cavity.

Again, Mr. Chairman, this proposed plan ought to include some particular means of instructing the teachers of the province in the matter of imparting instruction to their pupils on the question of oral hygiene.

Some two years ago our executive visited the Minister of Education and offered to have edited a small hand book, giving not only the necessary information to the teacher, but also telling how the subject of oral hygiene should be taught to the pupils in the schools. We urged that the Education Department publish such a hand book

and have them issued to each public school teacher in the Province of Ontario, and we also, Mr. Chairman, urged that more adequate instruction be given the teachers in training in the Normal schools in the province. These two propositions were fully explained to the Department. However, in their wisdom, they did not see fit to take up the matter as proposed.

The subject is now being brought by the oral hygiene committee before the teachers' conventions in the different counties of the province, and also by means of periodical pamphlets is being brought to the attention of the Women's Institutes, so that we feel, notwithstanding the many difficulties, that the work is making most favorable progress. The representative men from education circles who are at this meeting show the increased interest taken in this most important work among our school children. I trust, Mr. Chairman, that when these members return to their respective spheres of labor that they will take with them an inspiration from this gathering that will be influential in introducing this health-building reform into the schools of their own counties.

GENERAL DISCUSSION.

Dr. R. J. Reade, chairman of the oral hygiene committee, presided at the convention, and in his opening remarks complimented the Ontario Dental Society upon the representative character of the gathering. Dr. Reade dealt with the relationship of oral hygiene to citizenship, and particularly the necessity of good teeth in the army. He also referred to the economic phase of the oral hygiene question, and referred to a number of large institutions that had established dental clinics for dental services to their employees.

Mr. Cauldwell, member of the Board of Education for Chesley, reported that the matter of dental work in the schools had been presented to the board upon a number of occasions by Dr. Biehn, and he considered the Chesley school authorities now ready to act in the matter.

Dr. A. E. Webster referred to the boasted efficiency of Germany, and stated that, in his opinion, in so far as dentistry was concerned, the condition of the teeth of the German soldiers and also the methods of dental practice showed the German nation to be very far from efficient in so far as these matters were concerned. Dr. Webster urged greater publicity through the press in oral hygiene work, and also referred to the importance of the department of Preventive Dentistry in the Royal College of Dental Surgeons.

Inspector Denyes, of Milton, reported for his county, and referred particularly to progress in the towns of Oakville and Georgetown. He hoped soon to report equal progress throughout his whole county.

Inspector Smith, of Stratford, stated that the Canadian people had been severely "jarred" by the large number of rejections from

the army because of dental conditions, and considered that, while the educational work, the lectures, etc., in the past had been of value in bringing the oral hygiene question home to the people, the deplorable dental conditions of citizens, as brought out during the war, would have the effect of giving oral hygiene the important place it deserved as a public question. Inspector Smith paid tribute to the school nurse, and stated that the school teachers of the province were ready to co-operate in every way possible. The one thought in the minds of the teaching staff was the development of the best and highest type of Canadian citizenship.

Captain Struthers, who for many years was in charge of the Medical Department of the Board of Education, Toronto, drew attention to the fact that it was not sufficient to care for one part of the body alone, even though that part be the mouth. The whole faculties of the individual must be developed. Dr. Struthers related many personal experiences in connection with the establishment of medical work in the schools of Toronto, and his words were both interesting and practical.

Dr. Eaton, chairman of the educational committee of the Canadian Dental Association, spoke of the importance of team work between the school authorities and the oral hygiene committee. He complimented the oral hygiene committee of the Ontario Dental Society upon the work which was being accomplished in Ontario.

The C.A.D.C. Military District No. 13

MAJOR T. C. BRUCE, A.D.D.S., M.D., No. 13.

THE Summer Camp in Military District No. 13, at Sarcee, opened on the second day of June, 1916, and closed on the second day of November, a period of exactly five months: a period of sunshine and shadow, of gladness and sorrow; a period in which history was written with letters of blood on the battlefields of Europe; and a period in which our 12,000 soldiers at Sarcee Camp were being prepared to take their part in the titanic struggle for justice and liberty against oppression and autocracy, many of whom have already made the supreme sacrifice.

Sarcee Camp is situated on the Indian reservation of that name, about six miles from the city of Calgary, in a beautiful valley of the Elbow River, with the snow-clad peaks of the majestic rockies in the distance forming a beautiful background; an ideal location for a camp of this nature. The Calgary Municipal Railway extended its line to the camp in the early spring, thus giving the soldiers the privileges of city life, as well as camp life, at a small cost.

Up until the time of opening camp in June the C.A.D.C. in this

district was a subsidiary unit to the Army Medical Corps. But the rapid growth of the former, and its ever increasing importance as an adjunct to the active militia, necessitated it becoming an independent unit, and this was accordingly promulgated, with the commanding officer attached to the Headquarters Staff.

The General Officer Commanding and Headquarters Staff rendered every assistance possible in facilitating our work; commodious quarters were provided in a covered building, electric lights, telephone and waterworks were installed. As time wore on even the Department of Militia at Ottawa, through the untiring and incessant efforts of Lieut.-Col. Clayton, Director of Dental Services, began to realize that the C.A.D.C. was not merely a luxury, but an absolute necessity, and many of the annoyances and hindrances in securing equipment and supplies that were experienced in the initial stages of the unit have been removed.

Our maximum strength during the summer was 16 officers, 12 N.C.O.'s and 17 privates (including two cooks), a total of 45. In this connection it may be of interest to note that during the past 12 months the C.A.D.C. in this district has sent exactly 45 of all ranks for overseas service. Fourteen chairs were in use most of the summer, and the C.A.D.C. clinic was noted as being the busiest spot in camp. A summary of the work accomplished at Sarcee includes 3,292 amalgam fillings, 862 cement fillings, 7,484 extractions and 768 dentures, partial and full. In addition, a large amount of work was done for the officers and guards of the different internment camps in the district. So that we naturally feel that our work thus far has been of paramount importance, and are happy in the knowledge that we have been instrumental, in some degree, in preparing a large body of men for active service, who without our services would have been rejected as physically unfit.

Sarcee City, situated on the boundary of the camp lines, provided places of entertainment for the men during their hours "off duty." Billiard and pool halls, moving pictures, vaudeville, etc., being well patronized in the evenings. In addition, boxing bouts were frequently held in a large natural amphitheatre, within the lines, and during the long summer evenings baseball, football, and other manly sports were much in evidence until the last post was sounded. The Y.M.C.A. had also a large tent for concert purposes, and some splendid entertainments were here given by talent provided wholly from amongst the soldiers.

The social side of life amongst the members of the C.A.D.C. was not overlooked. We had our own marquees and recreation tents, and many pleasant evenings were spent in song and story and harmless amusements. Companionships were formed that will last as long as memory endures, and the good fellowship and harmony that prevailed amongst all ranks during the entire camp will be a pleasure to recall for years to come.



Officers:—1, Capt. A. A. Holliss; 2, Capt. L. V. Janes; 3, Capt. W. H. McLaren; 4, Major T. C. Bruce; 5, Capt. P. J. Healy; 6, Capt. R. H. Till; 7, Capt. F. W. Tweddle; 8, Lieut. C. J. Robertson; 9, Capt. R. W. Conn; 10, Capt. R. W. Alward; 11, Lieut. W. Nowell, Q.M.; 12, Capt. H. G. Hoare; 13, Capt. A. E. Jamieson; 14, Lieut. L. D. McLaurin; 15, Lieut. H. C. Goodhand.

N.C.O.'s:—16, Sgt. F. I. McDonald; 17, Sgt. R. R. McIntyre; 18, Sgt. W. Goodwin; 19, Sgt. J. Girvan; 20, Sgt. C. Pitt; 21, Q.M. Sgt. T. B. Donald; 22, Sgt. J. W. Smith; 23, Sgt. W. H. Overton; 24, Sgt. W. J. Taylor; 25, Sgt. B. D. Wood; 26, Sgt. A. Chaplain.

Privates:—27, Pte. A. E. Ashmore; 28, Pte. A. Inkpen; 29, Pte. B. H. Mitchell; 30, Pte. H. G. McFarquhar; 31, Pte. A. McRae; 32, Pte. G. Findlay; 33, Pte. S. Johnson; 34, Pte. C. Campbell; 35, Pte. P. Slingsby; 36, Pte. J. A. Williams; 37, Pte. J. L. Ritchie.

The only incident to mar the comforts of camp life was the fact that our cook was absent on leave for three weeks in midsummer, and we had to secure a substitute, who was very near-sighted; in fact, so near-sighted that he was generally spoken of as the "blind boy." As a consequence, fly soup, fly pie, hair pudding, finger-nail custards, etc., was our daily menu during this short period. But the boys took their medicine like real soldiers, MacLaurin remarking very philosophically that perhaps the grub was a good deal better than some of the poor fellows were getting in the trenches.

This, however, was only a passing incident in camp life, and did not dampen the ardor of the officers and men of the C.A.D.C., who performed their duties as only men can who know they are fighting for a just and righteous cause.

CALGARY, 18th November, 1916.

ORAL HYGIENE REPORTS.

Indianapolis, Ind.—At a recent meeting of the National Conference of Charities and Correction, held in the city of Indianapolis, Dr. Frederick R. Henshaw, Dean Indiana Dental College, exhibited a number of actual cases of bad care of the teeth and mouth, and spoke of the social effects of this condition.

Investments*

MR. H. I. THOMAS, OTTAWA.

THE first necessity is, of course, to define the terms, and an investment properly considered is really a loan on security at interest. All investments may be considered as covered by this definition, as, although investments in common stock may not at first appear to be of this character, they are really so, since the control of joint stock corporations is nearly always held in the hands of a few individuals, and the investor has very little to do with the management of the corporation. The investor, therefore, in purchasing common stock, is really making a loan to those who hold the controlling interest in the corporation, but in such cases the rate of interest is not fixed, but is dependent upon the action of the directors, which is, presumably, based on the profits of the undertaking.

If the above definition is considered as correct, it will be seen that the two factors which have to be considered are:

1. The security.
2. The rate of interest.

With regard to the first of these factors, viz.:

The Security—It will be noticed that this may be considered from various angles, and the following are perhaps the most important points to keep in mind when placing an investment on any given security, viz.:

1. Its character.
2. The relation between its value and the amount of the loan.
3. The extent of the lien which the investor has upon the security.
4. Its convertibility.

With regard to the character of the security, it will be noticed that all investments may be roughly divided into seven groups, as follows:

1. *Real Estate*, of which little need be said, except perhaps that insurance companies and other informed investors prefer high priced central properties to lower priced suburban properties.

2. *Banks and Trust Companies*, where the elements of double liability and freedom of the directors from direct control of the stockholders are the disadvantageous factors.

3. *Governmental and Municipal Obligations*, where the real security is the taxing power of the governing body, and the stability of that body.

4. *Railroad Issues*, where the element of government control of rates, wages, etc., must be borne in mind.

5. *Tractions and Public Utilities*, where the character of the franchise is all-important.

* Synopsis of an address given before the Ottawa Dental Society at its regular meeting in December, 1916.

6. *Industrials*, in which the personal character of the directors is perhaps the most important consideration.

7. *Mining Securities*, in which it must always be borne in mind that the dividend paid represents, in part at least, a return of the principal, and is not to that extent a true division of profits.

The value of the security must be carefully appraised by personal investigation of the investor, and the convertibility of the loan is sometimes an important matter, and in some cases may be ignored, but it will be noticed that the most convertible securities carry, as a rule, a lower rate of interest than those which are more inactive. With regard to the extent of the lien held upon the security by the investor, it should be noted that this varies greatly in the different classes of investments which are offered to the public, and, in considering bonds particularly, it should be determined by every investor whether the lien which he holds is a first, second, third or other charge upon the mortgaged property. Bonds are often offered to the general public under descriptions which are not clear, and the investor is wise to ascertain whether the bond which he proposes buying is a first mortgage, a consolidated mortgage, a general mortgage, a prior lien, a convertible, a refunding or other security. The meaning of all these terms should be clearly understood by the investor before making the proposed purchase. In the case of preferred stock, it should be noted whether the stock is preferred as to capital and interest, either or both, also whether it is cumulative or non-cumulative.

Turning now to the second important factor, viz., the *Rate of Interest*, it should be borne in mind that the rate of interest fluctuates over a very wide range, and the prospective investor should understand the causes of these fluctuations, which are, in part, determined by the productions of gold, as compared with the needs of the community, and also by the supply of, and demand for, funds at varying periods. We have a fairly accurate record of the changes in the current rate of interest from very early times until the present, and it will be noted that during the last fifty years the rate of interest has, on the whole, steadily advanced, thus making the purchase of long-term, low-interest-bearing bonds a poor investment.

It remains to consider some of the elementary principles of investment, and these may be summed up as follows:

1. *Distribution of Available Funds*. It is generally held to be undesirable to place the whole of one's investment in one security, but rather to distribute it over a number, all of which have been investigated, and are considered sound. These various securities should be in different groups or classes.

2. *The Rate of Interest Looked For Should Be Moderate*, as it has generally been found that, in the distribution of funds, when the investments are wisely made the rate of interest is rarely much over 5 per cent.

3. *Marginal Investments in Speculative Stocks Should Be Avoided*, as real profits are rarely realized in such cases.

4. *If Speculation is Desired*, it is better to calculate the long swings of the market, rather than those changes from day to day, or from month to month, which cannot possibly be anticipated even by the best informed. Tables have been prepared which show the fluctuation of high grade securities over long periods of time, and if these are carefully studied there is no reason why the variations over a period of years should not, to some extent, be anticipated.

On the whole, however, the best opinion of informed investors is that purchases should be made at market prices whenever funds are available, but that, in all cases, the best securities only should be selected, and a personal and careful investigation should be made by the investor of every security in which he contemplates making his investment.

Arthur Swayne Underwood, M.R.C.S., L.D.S.E.

THOS. COWLING, D.D.S., TORONTO.

ON December 2nd last there passed to the Great Beyond an English dentist and scientist of more than ordinary prominence.

Mr. Underwood was the English edition of the great American dentist, the late Dr. G. V. Black. In many respects they had the same characteristics, being at once diligent workers and keen observers. Both were able "to compass more useful, nay, valuable work than has been the lot of most men."

His father was Thomas Underwood, L.D.S., of Bradford Square, one of the pioneers of English dentistry. The father was associated with such men as Robert Hepburn, Charles Rogers, Sir John Tomes and Samuel Cartwright. The founding of the Dental Hospital in Soho Square was due to the untiring efforts of these men.

Arthur S. Underwood carried on his father's work and was responsible for the extension of dental activities, especially along the line of registration and compulsory education for dentists. His early education was received at King's College School. In 1886 he became dental surgeon at the Dental Hospital (now the Royal). From 1884 until 1896 he was lecturer on dental anatomy. While at King's College he was appointed Warneford Scholar and he took his degree of M.R.C.S. (Eng.) in 1877. A year later he secured his L.D.S. diploma. In 1884 he became professor of dental anatomy and physiology at King's College. He was also dental surgeon at King's College Hospital. From 1900 to 1910 he was a member of the faculty of medicine and sat on the Board of Studies in Dentistry of the University of London when that university decided to grant its degree in dental surgery. At the International Medical Congress, held in London, 1913, Underwood was elected vice-president of the



THE LATE ARTHUR SWANE UNDERWOOD,
M.R.C.S., L.D.S.E.

Stomatological Section, and in the following year he became president of the Anatomical Section of the International Dental Congress. He received (1906 to 1908) the Royal College of Surgeon's award of the Tomes' prize for research.

The realm of dentistry did not claim all of Mr. Underwood's energies, however, for he contributed largely to both science and literature as well. "How widely his energies were distributed may be gathered by recalling his charming pen and brush work, his intimate knowledge of Chinese faience—he edited the Chinese section of Chaffer's well-known work in 'Marks and Monograms on Pottery and Porcelain' when it was re-issued in 1897, also his excursions, not only into metaphysics, but also into the lighter side of literature."

As a scientist, Mr. Underwood accomplished much that received too little publicity. "He was too often content to remain silent when others adopted his work and forgot to pay honor to its author. As long ago as 1881, at the International Congress (London), Underwood, collaborating with his medical friend, the late Mr. W. J. Milles, published his research on 'The Nature of Dental Caries.' This fine piece of work was the first microscopic demonstration of the bacterial causation of dental caries. Koch, on seeing Underwood's

preparations, admitted he was convinced of the accuracy of his work and deductions. Dr. Miller, of Berlin, who was anxious to investigate the subject, sought out Underwood, who readily showed him his slides and described his methods, methods which Dr. Miller pursued in his subsequent work. It is significant that in 1883, two years later, Miller published his paper and admitted that he owed to Underwood his inspiration, but in subsequent issues this appropriate acknowledgement was omitted. In 1906 Underwood contributed an important paper on the 'Anatomy of the Maxillary Sinus.' This was read before the British Medical Association. In 1913, working in conjunction with Professor L. Evans, D.Sc., and Mr. A. W. Wellings, Underwood presented to the International Medical Congress a communication on the 'Nature of Enamel.' This striking piece of work was the first proof of the true nature of enamel, a material which had been assumed by most observers to be wholly of an organic composition."

During the latter part of his life Mr. Underwood devoted much time to anthropology. He assisted in the restoration of the jaws and teeth of Eoanthropos. Professor Keith, in his book on primeval man, gives much praise to Underwood's radiographic examination of the teeth and jaw of Eoanthropos.

It would surely be of much interest to Canadian dentists were a full account of Mr. Underwood's achievements arranged for publication.

[The quotations used above are from an editorial in the *British Journal of Dental Science*, December, 1916.]

Increased Phagocytic Activity

PHAGOCYTES, more commonly called Leucocytes or White Blood Corpuscles, have an important office to perform in the body. They act (1) in absorbing healthy tissues, as in the metamorphosis of batrachia and the development of bone; (2) in active degeneration of parts in disease; and (3) as a protective mechanism, removing bacteria and minute solid masses that have reached the tissues.

Hamburger has found that very small quantities of calcium salts increase phagocytic power to a considerable extent not only in the test tube, but also in the body. The introduction of small quantities, such as are at present in some natural mineral waters, by rectum has been found to promote the motility and chemotaxis of phagocytes. The immediate application of this will at once suggest itself. Taking it for granted, says Hamburger, that phagocytosis plays a part in the defence against microbes, we may infer from the foregoing that an enrichment of our blood, and through this also of the tissue fluids, with small amounts of calcium, must have a favorable effect on local and other infections.

THE COMPENDIUM

This Department is Edited by
THOMAS COWLING, D.D.S., Toronto

A SYNOPSIS OF CURRENT LITERATURE RELATING
TO THE SCIENCE AND PRACTICE OF DENTISTRY

SOME PROBLEMS FOR THE DENTAL EDUCATOR.

THE present curricula of our dental colleges differ widely from those of, say, five years ago. New subjects of study have been introduced, and all departments have been enlarged. The goal has not yet been reached, and all must work with renewed energies if our profession is to measure up to the ever-increasing demand of the times.

The era of the purely mechanical dentist has passed. We are anxious to develop men who are skilful in detecting and treating pathological conditions, not only of the oral cavity, but also of the associated tissues. So much for the objective; now for our method of attaining same. Are they likely to prove effective? Let us look about and see how our dental educational measures compare with those of the United States and Great Britain.

A fair comparison of our schools with those of the United States can hardly be made because of their having had, until this year, a three-year course, whereas ours covered four years. However, we are safe in stating that there will be introduced this year a much larger allotment of time to pathology and allied subjects.

A survey of the situation in Great Britain contains a certain element of surprise, for we find that in many of the English dental schools a preliminary training along lines followed by the medical student is required before the study of dentistry is entered upon. Dr. A. R. Walker, in a paper entitled "The Trend of Dental Education," published in the *Australian Journal of Dentistry*, September issue, reports on the status of the dental student in Great Britain. He finds that "the training of all dental and medical students is vested in the General Medical Council of Great Britain, who supervise what steps both the dental and medical students must take from the passing of a preliminary educational examination to the completion of his professional study." The dental student registers identically with the medical student—the same preliminary examination being required of both. Later on, the dental student may study for the conjoint diploma, and so obtain both the medical and dental

degrees. Thus it will be seen that there is an element in Great Britain that looks upon dentistry as a specialty of medicine, to be approached as such by means of a medical degree. Dr. Walker believes that dentistry will derive greater inspiration from association with medicine, and looks forward to the day when all dentists shall be qualified medical doctors. This time he considers is not very distant, and in support of his views he quotes from the requirements called for by various universities throughout Great Britain, viz.:

(1) National University of Ireland (University College, Cork), Department of Dentistry (Faculty of Medicine). The university grants the degree of Bachelor of Dental Surgery and Master of Dental Surgery, the Master of Dental Surgery being obtained three years after the Bachelor of Dental Surgery, which takes four years in itself.

(2) The University of Manchester grants the B.D.S. after a five years' course, and matriculation of this university is demanded in the first place.

(3) The University of Birmingham: They first demand that you possess a diploma by one of the licensing bodies, and then put in a further term at the Birmingham University before being privileged to sit for the B.D.S. and M.D.S. degrees.

(4) University of Dublin grants the B.D.S. and M.D.S. degrees, but demands their own Arts degree as a preliminary requisite. Furthermore, a candidate for the M.D.S. degree must first hold the B.D.S. degree and be of, at least, one year's standing, and then is required to pass examinations in pathology and bacteriology, and, either to carry out dental work of an advanced character to the satisfaction of the examiners, or to present a thesis to be approved by them giving evidence of original research on some subject connected with dentistry.

(5) University of Liverpool grants an L.D.S. after four years' study; a B.D.S. after a period of five years; the M.D.S. after a candidate possesses himself of the B.D.S., and (a) to furnish certificates in the Liverpool University after obtaining the degree of B.D.S., as follows: Dental Hospital, one year more; general pathology and bacteriology lectures, one course; general pathology and bacteriology practice, one course; (b) to produce evidence of research work in any approved subject having a practical application to the science and art of dental surgery during one year in any departments of the university. Therefore, to obtain the coveted M.D.S. of Liverpool University it would take a student at least six years.

(6) The University of London grants the degree of Master of Surgery in the following branches: Surgery (Branch I.) and Dental Surgery (Branch II.). Every candidate for the degree of Master of Surgery must have taken the degrees of Bachelor of Medicine and Bachelor of Surgery in the University of London. Every can-

didate in Dental Surgery must forward, together with his form of entry, the following certificates:

(a) A certificate of having spent at least three years in the study and practice of dentistry at a teaching school approved by the university, of which one year at least must have been *subsequent to obtaining the Bachelor of Medicine and the Bachelor of Surgery of the university*; (b) Of having held for at least six months an approved resident or non-resident appointment at a dental hospital.

What is the point of interest for us in reviewing these various requirements? Simply this, that, as Dr. Walker says, "the dental practitioner is not considered sufficiently competent to practise his profession simply by acquiring the absolute minimum of knowledge, while imbibing his professional training, and further, that there is a forcible necessity of directing his mind further and further into the domain of general medicine, so that when in practice he may the more comprehensively grapple with any complex pathological condition that may confront him."

In many of the recent publications in the United States we find opinions similar to those of Dr. Walker's. For instance, H. H. Schuhmann, M.D., D.D.S., in *Dental Review* (January), speaking of the question of oral infections, states: "It certainly has awakened the dental profession to do more accurate and better mechanical work, and has caused them to look more closely to proper therapeutics, but, best of all, *it has brought many of us to the realization of our want of medical knowledge generally*. No one to-day will question that oral infections have much to do with bodily disease, but to my mind there is also no question that this inter-relationship of oral infections to general health has been greatly exaggerated, and the methods to overcome it frequently unscientifically carried out. Our present mode of diagnosis of various oral disease manifestations have been inadequate and faulty, and surely leave much to be desired. Unfortunately, at the time most of us received our college education it was not deemed a requisite for dental practitioners to know much of medicine generally, and still less of the diagnostic value or the meaning of cultures, smears, urinalysis, blood analysis or pathology in general. To-day, when we are confronted with the realization that we are working on living tissues, and that a great interdependency exists between oral and general conditions, and that the abnormal findings obtained in these various analyses mean definite things, we must realize the undisputable fact that *we, as dentists, must have more medical education* in order to be able to cope properly with these conditions, and to be able to understand various medical findings intelligently." Later on in his paper, when considering the relationship of dentist and medical doctor, Dr. Schuhmann says: "When you consider the utter lack of fundamental medical education possessed by many dentists it is small wonder that

in meeting with physicians they are apt to be looked upon as little more than mechanics, and for that reason are ordered about as such. Our greatest need at the present time, I feel, is for more education along medical lines."

In order that the reader may see how prevalent this idea of insufficiency of medical knowledge with dentists is, we shall quote from Dr. T. W. Brophy's paper, "Improved Technique in Palatal Operations" (see *Dental Review*, January): "Where departments in colleges are elective, the medical student usually chooses branches in which he is interested, to the exclusion of very valuable instruction in other branches, a knowledge of which he will later need. The dental student fixes his vision upon a lucrative practice, which, with his immature understanding, he believes can be acquired if he learns only a part of the branches taught in his dental school. The scientific laboratory, the dissecting room, lectures and clinics in surgery, as a rule, have no allurements for him. If he can learn to make inlays, fillings, crowns and bridges; to know something of orthodontia, and have an extremely limited acquaintance with pathology, he feels that he is prepared to meet the requirements of a dental practitioner. This should not be so. It is not just to criticize a practitioner for a lack of knowledge of a subject which the college that he attended and from which he graduated did not teach. *A revision and expansion of the curricula of both medical and dental schools should be made in order to meet the present requirements.*"

An effort has been made in this article to point out how the opinions of representative dental thinkers of both continents are agreed that there is urgent need for the dental student to develop his studies so as to include a more comprehensive knowledge of pathology, bacteriology and associated subjects.

THE LACK OF SCIENTIFIC KNOWLEDGE AMONG DENTISTS.

The statement has often been made that dentists are at the mercy of the supply houses because they depend upon these agencies for data concerning the operation of new appliances or methods rather than upon their own observations and careful, scientific experiments. There is, perhaps, considerable cause for such a charge, for is it not a fact that our dental societies encourage agents with goods to sell to come before them and state the many so-called merits of their preparations, and yet make no announcement of the materials used in such preparations? Other gatherings of scientifically trained men do not tolerate such procedure, then why do dentists encourage it? Periodically, the profession becomes enthusiastic about some new discovery, and it is advertised far and wide as a positive curative agent, the entire profession clambers for it, tries it with varying success, and then it is heard of no more. A purpose has been served, however—the preparation has had an extensive sale, and sales mean

profits. The supply houses take advantage of the scientifically untrained dental graduates to sell their products and pocket the profits. One is apt to compare these fluctuations of enthusiasm, first for and then against these ever requiring remedial preparations or methods, to the swinging of the pendulum. The most recent swaying of dental thought is towards that large and important field of oral foci of infection, and much good is being done in this direction. There is grave danger, however, that the enthusiasts who do not dilute their enthusiasm with some little common sense may cause much harm to ensue in what otherwise promises to be a profitable field for dental investigation. To quote Dr. H. H. Schuhmann (*Dental Review*, January, 1917): "Having been a student of fundamental medical science for some years, it is hardly necessary for me to assure you that I am a thorough believer in the interrelationship of oral foci of infection with expressions of general pathological conditions situated elsewhere, and I wish to emphasize this fact in order that I may not be misunderstood, in case my drawing your attention to the overdoing of the theories involved might lead you to suspect that I was not a believer in these ideas. Quite the contrary: I am a very staunch supporter of them. Oral foci of infection must be removed, but before this our diagnosis must be correct. I feel that the pendulum of radical practice, associated with the removal of oral foci of infection, has swung much too far in one direction. I feel that it is high time a halt be called on the terrible propaganda of ruthless extraction that has gone very much too far, and has done our patients and our professional standing a great deal of harm. I fear that many members of our worthy profession have forgotten that they *are, or should be, scientific men*, men who should be able to draw scientific deductions—be able to prove them and insist upon such proper therapeutic measures as they know to be indicated. The mere production of an X-Ray film, signed by a photographer 'blind abscess,' should by no means mean an inevitable death warrant to a tooth—I mean its extraction."

Dr. Schuhmann, as the reader knows, is not only a dentist, but also a medical doctor, and so is particularly qualified to speak from the standpoint of one who is called upon to treat just such conditions as are popularly supposed to have their origin in the oral cavity, viz.: arthritis and endocarditis. He says: "I have seen a great many interesting cases, particularly of arthritis and endocarditis. I must admit, however, that the ultimate results in diagnosis and cure in these instances have been very much mixed. I believe that the proportion of cases benefited by the removal of what we call oral foci of infection to those who were not helped by whatever therapeutic measures were instituted by the dentist for that purpose, rather causes me to lean toward the conclusion that only the minority of cases were actually benefited by dental interference, including extractions."

The author recognizes that in many cases a blind abscess or an alveolitis pocket may have spread its infectious material to other localities, and thus little good comes from the removal of the primary cause. In some cases there were marked improvements shown after proper dental treatment had been given. This was true especially of cases of more recent secondary infection. Dr. Schultz, of Chicago (*Dental Review*, January), takes up this subject and reports in part as follows: "Often the secondary lesions clear up as the primary foci are eliminated; especially is this true in those cases where no permanent, incurable, anatomical changes have taken place. We must not lose sight of the fact that while we know that seemingly remote lesions often have their etiology in some focus of infection, they do not all enjoy such causative factors. Nor should we forget that even though they do depend upon such a focus for their being, that that focus does not necessarily reside in the mouth, nor residing in the mouth relate to the teeth." Billings says: "I think we should not use the word 'cause' too much in relation to the focus of infection of a systemic disease. We should not, even with the focus before us, say that that focus is the absolute cause."

Dentists should, as it were, hold themselves as the special protectors of the teeth and fight strenuously against the physician who orders the removal of all and sundry in the vain hope of cleaning up a situation, the cause of which he has not clearly ascertained. "Physicians," says Dr. Schuhmann, "are apt to look upon the value of the teeth in a negligible manner, and as only a few years ago the appendix was ruthlessly removed, followed later by a period of ruthless tonsillectomies, it has now become their idea in many instances to order extraction of the teeth in quite a prefatory manner. I regret to state that there are men in our profession who have fallen so far away from the truly scientific road that, in order to cater to physicians, they have practically become extractionists and plate makers in blindly following out the wishes of their medical confreres. There are two reasons, to my mind, why the independence of dentists has fallen to such a lamentably low state. One is the development of commercial ideas in the minds of some of these gentlemen, and the other I should say, at least charitably, is probably the more important one, and is *the lack of scientific knowledge* and their realization of such deficiency."

It may not be too late to add to our list of New Year's resolutions. Let us resolve to become more proficient in studying X-Ray photographs. In the past many of us, perhaps, have been guilty of forming hasty and incorrect judgments of many cases presented for treatment. The diagnosis ought not to be made by laboratory men. Dentists will do well to conserve this right for themselves. It is in this particular that the scientifically trained mind proves of great value. This is what Dr. Schuhmann has to say of diagnosis from

X-Ray photographs: "I have seen a great many pictures where a very slight shadow on the photograph has been finally demonstrated through the extraction of the tooth to be a large blind abscess, and I have also seen similar pictures where although a considerable darkened area was to be seen about the root end of a tooth when, upon extraction, the root surface exhibited no visible pathological disturbances whatever, no absorption and no remnants of a pus sac, and I believe that, in many instances, these darkened areas (unless they are so plain as to leave no doubt of an abscess) may mean a good many things, among them the possibility and probability of merely a condition of coagulated albuminous matter in the intercellular substances, due to the use of various drugs used in the devitalization of the pulp and in the treatment of the root canal. A good deal of care, therefore, in the interpretation of X-Ray pictures should be used, particularly if the photograph is taken for the purpose of aiding in the diagnosis of other bodily disturbances. The relation of the blood picture, urinalysis and microscopical findings to other infections generally is most important, and should be some of the additional methods of interpreting the meaning of possible oral infections."

Is it not possible that arsenious acid, as used in devitalizing pulps, may cause the coagulation of some of the albuminous matter contained in the minute lymph spaces and channels of the tissues about the apex of a tooth and so bring about the darkened areas of the X-Ray pictures? Again, it may be possible that the use of such drugs as formalin produces tissue changes sufficient to account for the shadow effects in the pictures.

Dr. Schultz, of Chicago, writing in the *Dental Review* of January, also makes a plea for greater care in the reading and interpretation of X-Ray photographs. He claims that a careful operator will want more than the roentgenogram to make a diagnosis. "He will want clinical evidence in addition, he will want all the subjective and objective symptoms present before venturing a diagnosis. For example, a shadow appearing in the periapical area of a tooth or several teeth may mean perfectly normal bone in that individual, as a comparison with the bone in other places of the picture will show, the shadow being cast because the bone in those areas does not contain as much mineral matter as in others. Or that shadow may represent a healing focus or a healed focus, healed by a filling in with connective tissue, with no deposition of lime salts; or it may denote an active focus causing irreparable harm to your patient. Hence my advice to be cautious."

In a recent editorial in *Pacific Gazette* appears the following statement: "Clinical results are flatly contradicting the assumption that every shadow upon the root of a tooth in a radiograph is a focus of infection, and laboratory experiments in these cases are

giving negative results. A shadow on the apex of a root may indicate one of several things, herein including the filling up of the cancellated spaces in the alveolar bone by a proliferation of the soft tissue which normally fills the cancellated spaces. If as the result of an involvement of the alveolar bone, following an infection emanating from the pulp or pericemental membrane, some of the cancellated spaces are destroyed, as occurs in osteo-myelitis, following, or simultaneous with, an inflammatory proliferation of the myelitic substance (the substance contained in the cancellated spaces), a dark shadow will be brought out upon the radiograph even though all bacterial elements be absent, *i.e.*, the density of the area has been materially decreased by the filling in of the enlarged cancellated spaces by soft tissues. Again, in the case of a chronic infection of the peridental membrane which has spread to the alveolar process, causing the loss of osseous substance, with, perhaps, practically no attempt at obliteration of the space by organic tissue, a dark shadow will be shown on the plate even after complete eradication of the infection."

In the September, 1916, issue of the *Journal of The Allied Dental Societies* was published a paper by Dr. P. R. Howe, of Boston, entitled, "Infections Arising From Apical Ends of Tooth Roots." A keen discussion of this paper took place and is reported in the December issue of *The Journal*. Among others, Dr. W. J. Lederer entered into criticism of the essayist's remarks, and says in part: "I feel that at present the pendulum is swinging too far in one direction, and that many physicians and dentists have been caught in a whirl of hysteria, and ascribe all the ills to which human flesh is heir to the teeth. To say offhand that pyorrhea or a blind abscess is the cause of rheumatism or anaemia is as logical as it is to demand the extraction of all teeth in arthritis. Yet both this statement and demand are frequently made, as they express the present attitude of the dental and medical extremists. Just because certain cases of arthritis improved after the removal of a lot of pyorrheal teeth, it is folly to make every arthritic edentulous. Every case must be examined carefully, and treated upon its individual merits or demerits. We must treat individual cases and not classes of cases."

Dr. A. H. Merritt says: "The fault has been, not in the light which investigation has thrown on these problems, but in the indiscriminate use that has been made of it."

Quotations might be given at great length to illustrate how many dentists grasp at shadows and do not seek the truth through scientific channels, but space will not permit of further references. In closing this article it might be well to make one final reference to Dr. Schuhmann's paper, spoken of above. He says: "It may be difficult for men who are busy and have left the matter of study to the younger generation for some time, to return to the arduous work of studying

and reading, but I am assured that some in the dental profession (and I am happy to note their increasing number) are advancing along the lines of scientific medicine and scientific dentistry at such a pace that it will only be a short time before our ranks will be found divided into mere mechanics and men of scientific education and ability."

The Nature, Manner of Conveyance and Means of Infantile Paralysis*

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THE Rockefeller Institute for Medical Research has been appealed to by so many physicians and laymen for information and advice on the subject of infantile paralysis that it has seemed desirable to relate the facts of present knowledge concerning certain highly pertinent aspects of the disease, together with deductions of practical importance derived from them.

Nature.—Infantile paralysis is an infectious and communicable disease which is caused by the invasion of the central nervous organs—the spinal cord and brain—of a minute, filterable micro-organism which has now been secured in artificial culture and as such is distinctly visible under the higher powers of the microscope.

Location of the Micro-Organism or Virus in the Sick.—The virus of infantile paralysis, as the micro-organism causing it is termed, exists constantly in the central nervous organs and on the mucous membrane of the nose and throat and of the intestines in persons suffering from the disease; it occurs less frequently in the other internal organs, and it has not been detected in the general circulating blood of patients.

Location of the Virus in Healthy Persons.—Although the micro-organism of infantile paralysis is now known, the difficulties attending its artificial cultivation and identification under the microscope are such as to make futile the employment of ordinary bacteriologic tests for its detection. Nevertheless, the virus can be detected by inoculation tests on monkeys, which animals develop a disease corresponding to infantile paralysis in human beings. In this manner the fact has been determined that the mucous membrane of the nose and throat of healthy persons who have been in intimate contact with acute cases of infantile paralysis may become contaminated with the virus, and that such contaminated persons, without falling ill them-

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selves, may convey the infection to other persons, chiefly children, who develop the disease.

Relation of Virus to Types of the Disease.—The virus has, apparently, an identical distribution irrespective of the types or severity of cases of infantile paralysis. Whether the cases correspond with the so-called abortive forms of the disease in which definite paralysis of the muscles does not occur at all, or is so slight and fleeting as often to escape detection; whether they correspond with the meningeal forms in which the symptoms resemble those of acute meningitis with which muscular paralysis may or may not be associated; or whether they consist of the familiar paralytic condition, the virus is present not only within the nervous organs, but also on the mucous membranes of the nose, throat and intestines.

Escape of the Virus from the Body.—Micro-organisms which convey disease escape from the body of an infected individual in a manner enabling them to enter and multiply within fresh or uninfected individuals in such a manner as to cause further disease. The virus of infantile paralysis is known to leave the infected human body in the secretions of the nose, throat and intestines. It also escapes from contaminated healthy persons in the secretions of the nose and throat. Whether it ever leaves the infected body in other ways is unknown. At one time certain experiments seemed to show that biting insects, and particularly the stable fly, might withdraw the virus from the blood of infected persons and inoculate it into the blood of healthy persons. But as the virus has never been detected in the blood of human beings, and later experiments with the stable fly have not confirmed the earlier ones, this means of escape of the virus must be considered doubtful. On the other hand, it has been shown by experiments on animals, so that the same facts should be regarded as applicable to human beings, that the virus seeks to escape from the body by way of the nose and throat, not only when inoculation takes place through these membranes, but also when the inoculation is experimentally made into the abdominal cavity, the blood, or the brain itself. From this it is concluded that the usual means of escape of the virus is by way of the ordinary secretions of the nose and throat and, after swallowing these, with the discharges of the intestines.

Entrance of the Virus into the Body.—The virus enters the body, as a rule if not exclusively, by way of the mucous membrane of the nose and throat. Having gained entrance to those easily accessible parts of the body, multiplication of the virus occurs there, after which it penetrates to the brain and spinal cord by way of the lymphatic channels which connect the upper nasal mucous membranes with the interior of the skull. Whether the virus ever enters the body in any other way is unknown. Certain experiments already referred to make it possible that it may be inoculated into the blood by insects, and other experiments have shown that under peculiar and extraordinary

conditions, it may in monkeys enter through the intestines. But while the latter two modes of infection may operate sometimes, observations in human cases of infantile paralysis and on animals all indicate that the main avenue of entrance of the virus into the body is by way of the upper respiratory mucous membrane, that is, the membrane of the nose and throat.

Resistance of the Virus.—The physical properties of the virus of infantile paralysis adapt it well for conveyance to the nose and throat. Being contained in their secretions, it is readily distributed by coughing, sneezing, kissing, and by means of fingers and articles contaminated with these secretions, as well as with the intestinal discharges. Moreover, as the virus is thrown off from the body mingled with the secretions, it withstands for a long time even the highest summer temperatures, complete drying, and even the action of weak chemicals, such as glycerin and phenol (carbolic acid), which destroys ordinary bacteria. Hence mere drying of the secretions is no protection; on the contrary, as the dried secretions may be converted into dust which is breathed into the nose and throat, they become a potential source of infection. The survival of the virus in the secretions is favored by weak daylight and darkness, and hindered by bright daylight and sunshine. It is readily destroyed by exposure to sunlight.

Conveyance by Insects.—Since epidemics of infantile paralysis always arise during the period of warm or summer weather, they have been thought of as possibly being connected with or dependent on insect life. The blood-sucking insects have especially come under suspicion. Experiments have been made with biting flies, bedbugs, mosquitoes, and with lice. Neither mosquitoes nor lice seem able to take the virus from the blood of infected monkeys or to retain it for a time in a living state. In one instance, bedbugs have been made to take up the virus from the blood of monkeys, but they did not convey it by biting to healthy monkeys. Certain experiments did indicate that the biting stable fly could both withdraw the virus from the blood of infected and reconvey it to the blood of healthy monkeys, which became paralyzed. But more recent studies have failed to confirm the earlier ones. Moreover, experimentally inoculated monkeys differ in one way from human beings suffering from infantile paralysis, for while the virus may appear in the blood of the former, it has never been detected in the blood of the latter. The ordinary or domestic fly may become contaminated with the virus contained in the secretions of the body and serve as the agent of its transportation to persons and to food with which it comes into contact. Domestic flies experimentally contaminated with the virus remain infective for forty-eight hours or longer. While our present knowledge excludes insects from being active agents in the dissemination of infantile paralysis,

they nevertheless fall under suspicion as being potential mechanical carriers of the virus of that disease.

Conveyance by Domestic Animals.—The attention which the recent epidemic of infantile paralysis has drawn to the diseases attended by paralysis has led to the discovery that domestic animals and pets are subject to paralytic diseases. The animals which have especially come under suspicion as possibly distributing the germ of infantile paralysis are poultry, pigs, and dogs and cats. But in isolated instances, sheep, cattle and even horses have been suspected. All these kinds of animals are subject to diseases in which paralysis of the legs and other parts of the body sometimes appear. In not a few instances, paralytic diseases among poultry or pigs have been noted to coincide with the appearance of cases of infantile paralysis on a farm or in a community. Experimental studies have, however, excluded the above-mentioned animals from being carriers of the virus of infantile paralysis. The paralytic diseases which they suffer have long been known and are quite different from infantile paralysis. Their occurrence may be coincidental; in no instance investigated has one been found to be responsible for the other.

Routes of Travel.—Studies carried out in various countries in which infantile paralysis has been epidemic all indicate that, in extending from place to place or point to point, the route taken is that of ordinary travel. This is equally true whether the route is by water or land, along a simple highway or the line of a railroad. In other words, the evidence derived from this class of studies confirms the evidence obtained from other sources in connecting the distributing agency intimately with human beings and their activities.

Survival of the Virus in the Infected Body.—The virus of infantile paralysis is destroyed in the interior of the body more quickly and completely than, in some instances, in the mucous membrane of the nose and throat. It has been found in monkeys, in which accurate experiments can be carried out, that the virus may disappear from the brain and spinal cord within from a few days to three weeks after the appearance of the paralysis, while at the same time it is still present on the mucous membranes mentioned. The longest period after inoculation in which the virus has been detected in the mucous membrane of the nose and throat of monkeys is six months. It is far more difficult to detect the human than the monkey carriers of the virus since, as directly obtained from human beings, the virus displays a low degree of infectivity for monkeys; while once adapted to monkeys, the virus becomes incredibly active, so that minute quantities are capable of ready detection by inoculation tests. Yet in an undoubted instance of the human disease, the virus was detected in the mucous membrane of the throat five months after its acute onset. Hence we possess conclusive evidence of the occurrence of occasional chronic human carriers of the virus of infantile paralysis.

Fluctuation in Epidemics.—Not all epidemics of infantile paralysis are equally severe. Indeed, great variations or fluctuations are known to occur not only in the number of cases, but also in the death rate. The extremes are represented by the occasional instances of infantile paralysis known in every considerable community and from which no extension takes place, and the instances in which in a few days or weeks the number of cases rises by leaps and bounds into the hundreds, and the death rate reaches 20 per cent. or more of those attacked. While all the factors which determine this discrepancy are not known, certain of them have become apparent. A factor of high importance is the infective power or potency, or, technically stated, the virulence, of the micro-organism or virus causing the disease. The virus is subject to fluctuations of intensity which can best be illustrated by an example. The virus as ordinarily present in human beings even during severe epidemics has low infective power for monkeys. But by passing it from monkey to monkey, it tends to acquire after a variable number of such passages an incredible activity. However, occasional samples of the human virus refuse to be thus intensified. But once rendered highly potent, the virus may be passed from monkey to monkey through a long but not indefinite series. Finally, in some samples of the virus at least a reverse change takes place—the virus begins to lose its virulence until it returns to the original or even to a diminished degree of infective power. In this respect the behavior of the virus corresponds to the onset, rise and then fall in number and severity of cases as observed in the course of epidemics of infantile paralysis and other epidemic diseases. Hence either a new active specimen of the virus may be introduced from without which, after a certain number of passages from person to person, acquires a high potency; or a specimen of virus already present and left over from a previous epidemic after a resting period and similar passages again becomes active, and reaches an infective power which equals or even exceeds that originally possessed. Another but more indefinite factor relates to the degree of susceptibility among children and others affected, which at one period may be greater or less than at another.

Varying Individual Susceptibilities.—Not all children and relatively few adults are susceptible to infantile paralysis. Young children are more susceptible, generally speaking, than older ones; but no age can be said to be absolutely insusceptible. When several children exist in a family or in a group, one or more may be affected, while the others escape or seem to escape. The closer the family or other groups are studied by physicians, the more numerous it now appears are the number of cases among them. This means that the term “infantile paralysis” is a misnomer, since the disease arises without causing any paralysis whatever, or such slight and fleeting paralysis as to be difficult of detection. The light or abortive cases, as

they are called, indicate a greater general susceptibility than has always been recognized, and their discovery promises to have far-reaching consequences in respect to the means employed to limit the spread or eradicate foci of the disease.

Period of Incubation.—Like all other infectious diseases, infantile paralysis does not arise at once after exposure, but only after an intervening lapse of time called the period of incubation. This period is subject to wide limits of fluctuation: in certain instances it has been as short as two days; in others it has been two weeks or possibly even longer. But the usual period does not exceed about eight days.

Period of Infectivity.—Probably the period at which the danger of communication is greatest is during the very early and acute stage of the disease. This statement must be made tentatively since it depends on inference, based on general knowledge of infection, rather than on demonstration. Judging from experiments on animals, the virus tends not to persist in the body longer than four or five weeks, except in those exceptional instances in which chronic carriage is developed. Hence cases of infantile paralysis which have been kept under supervision for a period of six weeks from the onset of the symptoms may be regarded as practically free of danger.

Protection by Previous Attack.—Infantile paralysis is one of the infectious diseases in which insusceptibility is conferred by one attack. The evidence derived from experiments on monkeys is conclusive in showing that an infection which ends in recovery gives protection from a subsequent inoculation. Observations on human beings have brought out the same fact, which appears to be generally true, and to include all the forms of infantile paralysis, namely, the paralytic, meningeal or abortive, which all confer immunity.

Basis of the Immunity.—The blood of normal persons and monkeys is not capable of destroying or neutralizing the effect of the virus of infantile paralysis. The blood of persons or monkeys who have recovered from the disease is capable of destroying or neutralizing the effect of the virus. The insusceptibility or immunity to subsequent infection, whether occurring in human beings after exposure or monkeys after inoculation, rests on the presence of the destroying substances, the so-called immunity bodies, which arise in the internal organs and are yielded to the blood. So long as these immunity bodies persist in the body, protection is afforded; and their presence has been detected twenty years or even longer after recovery from infantile paralysis. Experiments have seemed to show that the immunity bodies appear in the blood in the course of even the mildest attack of the disease, which fact explains why protection is afforded irrespective of the severity of the case.

Active Immunization.—Protection has been afforded monkeys against inoculation with effective quantities of the virus of infantile paralysis by previously subjecting them to inoculation with subeffec-

tive quantities or doses of the virus. By this means and without any evident illness or effect of the protective inoculation, complete immunity has been achieved. But the method is not perfect, since in certain instances not only was immunity not obtained, but unexpected paralysis intervened. In the instances in which protection was accomplished, the immunity bodies appeared in the blood.

Passive Protection.—By transferring the blood of immune monkeys to normal or untreated ones, they can be rendered insusceptible or immune, and the immunity will endure for a relatively short period during which the passively transferred immunity bodies persist. The accomplishment of passive immunization is somewhat uncertain, and its brief duration renders it useless for purposes of protective immunization.

Serum Treatment.—On the other hand, a measure of success has been achieved in the experimental serum treatment of inoculated monkeys. For this purpose blood serum derived either from recovered and protected monkeys or human beings has been employed. The serum is injected into the membranes about the spinal cord, and the virus is inoculated into the brain. The injection of serum must be repeated several times in order to be effective. Use of this method has been made in a few instances in France, where the blood serum derived from persons who had recovered from infantile paralysis has been injected into the spinal membranes of persons who have just become paralyzed. The results are said to be promising. Unfortunately, the quantity of the human immune serum is very limited, and no other animals than monkeys seem capable of yielding an immune serum, and the monkey is not a practicable animal from which to obtain supplies.

Drug Treatment.—The virus of infantile paralysis attacks and attaches itself to the central nervous organs. Hence it is not only reached with difficulty because nature has carefully protected those sensitive organs from injurious materials which may gain access to the blood, but it must also be counteracted by substances and in a manner that will not themselves injure those sensitive parts. The ideal means to accomplish this purpose is through the employment of an immune serum, since serums are among the least injurious therapeutic agents. The only drug which has shown any useful degree of activity is hexamethylenamin, which is itself germicidal, and has the merit of entering the membranes, as well as the substance of the spinal cord or brain in which the virus is deposited. But experiments on monkeys have shown this chemical to be effective only very early in the course of the inoculation and only in a part of the animals treated. Efforts to modify and improve this drug by chemical means have up to the present been only partially successful. The experiments have not yet reached the point at which the drugs are applicable to the treatment of human cases of infantile paralysis.

PRACTICAL DEDUCTIONS AND APPLICATIONS.

1. The chief mode of demonstrated conveyance of the virus is through the agency of human beings. Whether or not still other modes of dissemination exist is unknown. According to our present knowledge, the virus leaves the body in the secretions of the nose and throat and in the discharges from the intestines. The conveyers of the virus include persons ill of infantile paralysis in any of its several forms and irrespective of whether they are paralyzed or not, and such healthy persons who may become contaminated by attendance on or association with the ill. How numerous the latter class may be is unknown. But all attendants on or associates of the sick are suspect. These healthy carriers rarely themselves fall ill of the disease; they may, however, be the source of infection in others. On the other hand, the fact that infantile paralysis is very rarely communicated in general hospitals to other persons, whether doctors, nurses or patients, indicates that its spread is subject to ready control under restricted and supervised sanitary conditions.

2. The chief means by which the secretions of the nose and throat are disseminated is through the act of kissing, spitting, coughing or sneezing. Hence, during the prevalence of infantile paralysis, care should be exercised to restrict the distribution as far as possible through these common means. Habits of self-denial, care, and cleanliness and consideration for the public welfare can be made to go very far in limiting the danger from these sources.

Moreover, since the disease attacks by preference young children and infants, in whom the secretions from the nose and mouth are wiped away by mother or nurse, the fingers of these persons readily become contaminated. Through attention on other children or the preparation of food which may be contaminated, the virus may thus be conveyed from the sick to the healthy. The conditions which obtain in a household in which a mother waits on the sick child and attends the other children are directly contrasted with those existing in a well ordered hospital: the one is a menace, the other a protection to the community. Moreover, in homes the practice of carrying small children about and comforting them is the rule, through which not only the hands, but other parts of the body and the clothing of parents may become contaminated.

3. Flies also often collect about the nose and mouth of patients ill of infantile paralysis and feed on the secretions, and they even gain access to the discharges from the intestines in homes unprotected by screens. This fact relates to the domestic fly, which, becoming grossly contaminated with the virus, may deposit it on the nose and mouth of healthy persons, or on food or eating utensils. To what extent the biting stable fly is to be incriminated as a carrier of infection is doubtful; but we already know enough to wish to exclude from the sick, and hence from menacing the well, all objectionable household insects.

Food exposed to sale may become contaminated by flies or from fingers which have been in contact with secretions containing the virus; hence food should not be exposed in shops, and no person in attendance on a case of infantile paralysis should be permitted to handle food for sale to the general public.

4. Protection to the public can best be secured through the discovery and isolation of those ill of the disease, and sanitary control of those persons who have associated with the sick and where business calls them away from home. Both these conditions can be secured without too great interference with the comforts and the rights of individuals.

In the first place, where homes are not suited to the care of the ill so that other children in the same or adjacent families are exposed, the parent should consent to removal to hospital in the interest of the sick child itself, as well as in the interest of other children. But this removal or care must include not only the frankly paralyzed cases, but also the other forms of the disease. In the case of doubtful diagnosis, the aid of the laboratory is to be sought, since even in the mildest cases changes will be detected in the cerebrospinal fluid removed by lumbar puncture. If the effort is to be made to control the disease by isolation and segregation of the ill, then these means must be made as inclusive as possible. It is obvious that in certain homes isolation can be carried out as effectively as in hospitals.

But what has been said of the small incidence of cases of the disease among the hospital personnel, and those with whom they come into contact, indicates the extent to which personal care of the body by adults and responsible people can diminish the menace which those accidentally or unavoidably in contact with the ill are to the community. Care exercised not to scatter the secretions of the nose and throat by spitting, coughing or sneezing, the free use of clean handkerchiefs, cleanliness in habits affecting especially the hands and face, changes of clothes, etc., should all act to diminish this danger. But in the end, the early detection and isolation of the cases of infantile paralysis in all of its forms, with the attendant control of the households from which they come, will have to be relied on as the chief measure of staying the progress of the epidemic.

5. The degree of susceptibility of children and other members of the community to infantile paralysis is relatively small and is definitely lower than to such communicable diseases as measles, scarlet fever and diphtheria. This fact in itself constitutes a measure of control; and while it does not justify the abatement of any practicable means which may be employed to limit and suppress the epidemic, it should tend to prevent a state of overanxiety and panic from taking hold of the community.

6. A percentage of persons, children particularly, die during the acute stage of the disease. This percentage varies from five in cer-

tain severe epidemics to twenty in others. The average death rate of many epidemics has been below 10 per cent. A reported high death rate may not be actual, but only apparent, since in every instance the death will be recorded, while many patients who recover may not be reported at all to the authorities. In the present instance it is too early in the course of the epidemic to calculate the death rate, which may prove to be considerably lower than it now seems to be.

7. Of those who survive, a part make complete recoveries, in which no crippling whatever remains. This number is greater than is usually supposed, because it includes not only the relatively large number of slight or abortive cases, but also a considerable number of cases in which more or less of paralysis was present at one time. The disappearance of the paralysis may be rapid or gradual—may be complete in a few days or may require several weeks or months.

The remainder, and unfortunately not a small number, suffer some degree of permanent crippling. But even in this class, the extent to which recovery from the paralysis may occur is very great. In many instances the residue of paralysis may be so small as not seriously to hamper the life activities of the individual; in others in whom it is greater, it may be relieved or minimized by suitable orthopedic treatment. But what it is imperative to keep in mind is that the recovery of paralyzed parts and the restoration of lost muscular power and function is a process which extends over a long period of time—that is, over months and even years. So that even a severely paralyzed child who has made little recovery of function by the time the acute stage of the disease is over, may go on gaining for weeks, months and even years, until in the end he has regained a large part of his losses. Fortunately, only a very small number of the attacked are left severely and helplessly crippled. Lamentable as it is that even one should be so affected, it is nevertheless a reassurance to know that so many recover altogether, and that so much of what appears to be permanent paralysis disappears in time.

There exists at present no safe method of preventive inoculation or vaccination, and no practicable method of specific treatment. The prevention of the disease must be accomplished through general sanitary means; recovery from the disease is a spontaneous process which can be greatly assisted by proper medical and surgical care. Infantile paralysis is an infectious disease, due to a definite and specific micro-organism or virus; recovery is accomplished by a process of immunization which takes place during the acute period of the disease. The tendency of the disease is toward recovery, and it is chiefly or only because the paralysis in some instances involves those portions of the brain and spinal cord which control respiration or breathing and the heart action that death results.

Finally, it should be added that not since 1907, at which time the

great epidemic of infantile paralysis of poliomyelitis appeared in this country, has the country or this state or city been free of the disease. Each summer since has seen some degree of accession in the number of cases; the rapid rise in the number of cases this year probably exceeds that of any previous year. But it must be remembered that in 1908, several thousand cases occurred in the greater city—possibly indeed many cases of and deaths due to the disease were never reported as such. Hence the present experience, severe and serious as it is, is not something new; the disease has been severely epidemic before and was brought under control. The knowledge regarding it now is far greater than it was in 1908; and the forces of the city which are dealing with the epidemic are probably better organized and in more general co-operation than ever before. The outlook, therefore, should not be regarded as discouraging.

Calgary Dental Club

DR. C. V. SNELGROVE, Treasurer of the Canadian Army Dental Fund, has received a contribution of \$20.00 from the Calgary Dental Club through the Secretary, Dr. E. H. Simmons. The Calgary Club also contributed \$25.00 to the Canadian Army Dental Fund last year.

Book Review

Essentials of Operative Dentistry by W. Clyde Davis, M.D., D.D.S., Dean and Professor of Operative Dentistry and Technic, Lincoln Dental College, Lincoln, Nebraska. Second revised edition published by C. V. Mosby Company, St. Louis, Mo.

THE second edition of this book is essentially a new book rather than a second edition. It is written in a most concise and readable style, and the substance matter is reached without any waste of time. The arrangement of the subject is good and the illustrations excellent. The book will appeal especially to the undergraduate, although any practitioner would improve his library by its addition.

In the opinion of the writer the weak chapter is the one on root canal treatment. It is not extensive enough for this most important subject. However, when we consider "Black's Dental Pathology" any other extensive treatment would no doubt be a repetition of the subject. The work would possibly be improved by the addition of a few chapters on other phases of operative procedures, and the author's definition of operative dentistry might be made more comprehensive. The volume is recommended to the profession and particularly to students of dentistry.—A. D. A. M.

MULTUM IN PARVO

This Department is Edited by
C. A. KENNEDY, D.D.S., 2 College Street, Toronto

HELPFUL PRACTICAL SUGGESTIONS FOR PUBLICATION, SENT IN BY MEMBERS OF THE PROFESSION, WILL BE APPRECIATED BY THIS DEPARTMENT

CELLUTONE FOR REPAIR OF PLASTER MODELS.—Cellutone is a clear, viscid liquid, made by dissolving approximately one gramme of celluloid in ten cubic centimeters of acetone. With this solution a broken plaster cast may be repaired so perfectly that it is difficult to detect, and when permitted to thoroughly dry out the plaster will break in any other part easier than it will in the repaired fracture. The clean, clear celluloid strips that are no longer useful for condensing silicate fillings are valuable for this purpose.—*D. N. Lewis, Lake Forest, Ill. (Dental Review).*

INDICATIONS FOR EXTRACTION OF ABSCESSED TEETH.—In abscessed conditions, which cannot be relieved by treating, delay is dangerous, and frequently fatal, to the patient's life. Numerous cases are on record where patients have died of septic pneumonia or septic endocarditis, which has been traced to one or more infected teeth. In such cases, therefore, operation at once is indicated to save the life of the patient. The custom of some dentists, to wait until swelling has subsided before extracting abscessed roots, is wrong, and is unfair to the patient. Drainage should at once be established, and the most effective way to do this is by taking out the diseased roots.—*S. S. Swihart, Western Dental Journal.*

HOW MODELING COMPOUND CAN BE SPOILED.—There are many ways in which compound can be spoiled, a few of which are as follows: First, by overheating. When the compound has lain in boiling water for a few minutes it will not only lose its quick-setting qualities, but when it does set it will not be hard. If left lying in water of over 180 degs. for half an hour or more it will not set quickly or be nearly so hard. Compound should never be used a second time. When a cast has been poured into a compound impression, the plaster seems to extract or neutralize some of its qualities, so that it not only sets more slowly, but is more difficult to work, and will not secure the best results. Many impressions are failures for this reason alone. They are easily bent, and will be changed materially by the lips when taking them out of the mouth. After the com-

pound has lain in water of 120 degs. or more for over five hours it will lose many of its qualities for quick, accurate work.—S. G. *Supplee, Dental Digest.*

TO FRESHEN GOLD FOR CASTING.—Never use the same gold for casting more than once without cleaning. This can readily be done by making a metal casing for a carbon block to overcome block cracking under heat. Place gold in carbon block, and while in molten condition add a mixture of one part of borax to three parts of potassium nitrate. This kept up for a few minutes will render gold in splendid condition for casting and good results may then be expected.—W. D. N. *Moore, Chicago.*

LIGATURES.—In the lower incisors, particularly when the ligature is not sufficient to retain the rubber dam in position, a small wisp of cotton is rolled up between the thumb and finger to a hard ball and tied to the thread; this, when ligated to the tooth, will act most efficiently.—W. N. *Short, Commonwealth Dental Review.*

DISCOLORATION OF TEETH DUE TO METAL POSTS.—A greenish discoloration of teeth bearing inlays retained by posts, or of roots supporting dowel crowns, may usually be traced to the employment of German silver or nickel alloy post material. Teeth thus discolored are very difficult, if not impossible, to bleach, but the condition may be avoided by using 12 per cent. platinum clasp metal, or iridio-platinum wire for all posts.—P. G. *Puterbaugh, Dental Record.*

TO REMOVE A SHELL CROWN WITHOUT DISCOLORATION.—It is occasionally necessary that a shell crown has to be removed. In order that this may be done with as little distortion as possible a small hole is burred through the buccal aspect of the crown on a level with the top of the root. Introduce a suitable sharp-pointed instrument through the hole and gently lever off the crown. It is surprising how easily this can be done.—T., *Australian Journal of Dentistry.*

SUSCEPTIBILITY TO COCAIN POISONING.—Patients once having been poisoned by cocain are susceptible to very small doses, a fact we should bear in mind when patients give us such a history.—J. E. *Stoffer, Michigan Dental Journal.*

PREVENTING STEEL HYPODERMIC NEEDLES FROM RUSTING.—Rusting and consequent clogging of steel hypodermic needles is prevented by equal parts of almond oil and alcohol. This mixture may be kept in a covered glass dish or a wide-mouth bottle, and the needles allowed to remain in the solution when not in use. They may easily be removed with tissue forceps, the oil allowed to drain, and what remains in the calibre of the needles can be cleared out with a jet of alcohol. Solutions containing bacteria and vaccines seem especially prone to produce clogging of needles, and this annoyance can be prevented absolutely, and the life of the needle indefinitely prolonged by the use of the almond oil-alcohol mixture.—B. *Wolff, Journal American Medical Association.*

ORAL HEALTH

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TORONTO, FEBRUARY, 1917

No. 2

EDITORIAL

The Ontario Dental Society Semi-Centennial

THE convention of the Ontario Dental Society for 1917 bids fair to be epoch making, both in character and attendance. In short, the event promises to be of such importance that every practitioner in the province will want to be present. The society will be fifty years old and we are going to celebrate.

Such radical changes in the make-up of the meeting are being planned by the committee in charge that, when the good old society looks upon the great gathering next May, it will scarcely recognize its old self. In fact, it will not be a convention in the usual meaning of that term, but rather a post-graduate course conducted by five of the most prominent dental teachers of this continent. The course will last one week—from Monday at noon until Saturday at noon. The lecturers are recognized masters of their subjects, and shall be given time to teach these subjects so fully and plainly that the ordinary practitioner will have no difficulty in understanding. Here are the five men who are going to conduct this course; they are those who, as teachers and practitioners, fill to-day a very large place in the dental profession of the United States and Canada:

Dr. C. N. Johnson, of Chicago, on Operative Dentistry and Management of Practice.

Dr. Forest H. Orton, of St. Paul, Minn., on Crown and Bridge Work.

Dr. M. L. Rhein, of New York, on Root Canal Treatment and Filling.

Dr. Arthur Hopewell-Smith, of Philadelphia, on Pathology.

Dr. W. E. Cummer, of Toronto, on Partial Dentures and Removeable Bridge Work.

Most of these lectures will be illustrated by lantern slides and in other ways. The ordinary clinics will be cut out, and the whole course will consist of these illustrated lectures and a first-class exhibit by the leading dental manufacturers.

The programme committee is made up of a dozen or so earnest men, who are not sparing time, energy or expense to make this the greatest meeting in the history of the society.

The fee will be \$5.00. It could not be any less. It might, with justice, be a good deal more. There will be so much for so moderate a fee:—About a dozen illustrated lectures on subjects you are hungering to know more about—A first-class manufacturers' exhibit—Your wants looked after—Your ladies entertained and the companionship of the best practitioners of the Province of Ontario. That is a great deal to be crowded into one short week, but the programme committee say they can do it, and no doubt they will.

ORAL HEALTH has always stood for progress, and therefore hails with delight this forward step on the part of the Ontario Dental Society. The old and long-tried convention plan of a half-hour essay on some particular subject, followed by a rambling and protracted discussion has, we believe, served its day of usefulness. We welcome the change—the reaching out to greater and better things.

Come to Toronto for the week of May 21st-26th, every man of you, and bring your ladies along. The committee is planning to give you all a hearty welcome and *something really worth while in dentistry.*

An Interesting Case

CAPTAIN CHAS. E. McLAUGHLIN, C.A.D.C., attached to No. 2 Canadian General Hospital, British Expeditionary Force, reports an interesting case from France of a soldier with a bad knee that would not heal; for a time the infection could not be located; subsequently the mouth was examined and teeth found in a diseased condition; after treatment of the oral cavity the knee soon healed. Cultures were made of both the knee lesion and the teeth, and identical germs were found in the two swabs. Captain McLaughlin's judgment was that this case was "one more victory for oral health."

Dentaly Fit

IT is time the Royal Army Medical Corps woke up to the dental needs of the soldier and recognized the important place the dental surgeon should occupy in the modern army.

It is reported that in England an order recently went through that "roots should be left in the mouth, rather than extraction and replacement with dentures; and that more time be spent in keeping the mouths of the men clean." The incongruity is almost incredible, and yet that is precisely the situation where some individual, other than a dentist, has the final word regarding dental services. The fact that a dentally fit man is considered one with at least four occluding molars on *one* side—two upper and two lower—stamps the Imperial dental services as ridiculously inefficient. Canada has shown the way in the organization of the Canadian Army Dental Corps, but the British authorities are apparently slow to follow. The dentists certainly need a Sam Hughes on the other side of the pond.

Captain Staples Married in England

St. Leonards-on-Sea, Sussex, England,
December 17, 1916.

Dr. Wallace Seccombe,
Toronto, Canada.

Dear Doctor Seccombe,—As I thought that it might be of interest to yourself and readers of ORAL HEALTH I am sending herewith announcement of Captain R. C. H. Staples' marriage.

Married—On December 9, 1916, at the Parish Church, Brighton, Sussex, R. C. H. Staples (Capt. C.A.D.C.), of Toronto, Ont., and Marian, only daughter of Mrs. Watson, 4 Norfolk Square, Brighton.

Captain Staples is stationed with the dental clinic attached to the Canadian Command Depot, St. Leonards-on-Sea, Sussex.

At present there are nine operators in this clinic and much good work is being accomplished in making men fit to "carry on."

Yours very truly,

CHAS. E. WRIGHT,
Capt. C.A.D.C.

[The many Canadian friends of Captain Staples extend to him hearty congratulations and best wishes.—EDITOR.]

Yesterday---To-day

THE DENTISTRY OF YESTER-DAY rendered important service to humanity by saving diseased teeth.

THE LARGER SERVICE OF TO-DAY, however, is that of saving the teeth in health.



CAPTAIN FULTON RISDON, M.B., D.D.S.

Captain Risdon is Professor of Anatomy in the Royal College of Dental Surgeons and has gone overseas as a member of the Canadian Army Medical Corps. Captain Risdon, after graduation in dentistry, completed a medical course at the University of Toronto with a view to specializing in oral surgery. He has spent the past year and a half in taking post-graduate work in oral surgery with Dr. Truman Brophy, of Chicago, and at the Manhattan Eye, Ear, Nose and Throat Hospital, New York. It is expected that Captain Risdon will be given opportunity, while overseas, to render the special service for which his training and experience have fitted him.

ORAL HEALTH

A JOURNAL THAT STANDS FOR THE "OUNCE OF
PREVENTION," AS WELL AS THE "POUND OF CURE"

VOL. 7

TORONTO, MARCH 1917

No. 3

Metastatic Focal Infections

FULTON RISDON, M.B., D.D.S., TORONTO, PROFESSOR OF
ANATOMY, ROYAL COLLEGE OF DENTAL SURGEONS.

BACTERIOLOGISTS have gone a step in advance of many other experimenters, and in so doing have conferred a lasting benefit on mankind. The work done recently on focal infections goes to elaborate the above statement, and in reviewing the literature one feels that these gentlemen are on the verge of very important disclosures, which will, we trust, assist the clinician in his diagnosis.

Certain organs or tissues in the body seem favorable for invasion and growth of some forms of bacteria. These are called "focal localities," and those of most interest to the dentist or oral surgeon are the teeth and the surrounding tissues, perhaps including the tonsils. We feel reasonably sure that from these focal localities, when diseased or infected, certain bacteria or toxins pass into the general system in some manner not as yet fully understood. "Focal infections," says Rosenow, "are not to be viewed merely as a place of entrance of bacteria, but rather as a place where conditions are favorable for them to acquire the properties which give them a wide range of affinity for the various structures."

Bacteriologists such as Kock, Rosenow, Davis, Buerger, and many others have shown that certain bacteria, mainly the streptococcus, can change their physical characteristics to a very great extent, so much so that they closely imitate other forms of bacteria. This is well shown by Rosenow in his work on transmutation, published in the *Journal of the American Medical Association* of December 5, 1914. He took the encapsulated pneumococcus, and by various

processes reduced it in its virulence, first, to streptococcus viridans, then to streptococcus rheumaticus, then to streptococcus hemolyticus, and finally reversed the process, carrying it back to the pneumococcus. He speaks of it as on the fingers of a partly flexed hand, the index finger representing the pneumococcus, second finger the streptococcus viridans, third finger the streptococcus rheumaticus, and the fourth or little finger streptococcus hemolyticus. To reduce the virulence he grew on agar, or with certain other bacilli, but to increase the virulence he injected them into rabbits, each rabbit through which they passed increasing the virulence.

When speaking of the hemolytic property, the bacteriologist means the power the organism has to produce a clear zone of hemolysis about the colonies on the blood agar plate, when incubated at 37 degs. C for twenty-four hours, and best seen when held up to the light.

One interesting experiment carried out by Rosenow consisted in using a strain of typical pneumococcus, which had been sealed in a pipette for five years, then studied, showed hemolytic streptococcus, and on injection into animals gave joint symptoms. This strain, now planted on agar, produced streptococcus viridans, and when injected into animals resulted in the expected manifestations, namely, endocarditis without joint symptoms. This strain, further cultured by passing through eighteen rabbits, resulted in the pneumococcus producing on injection, pneumonia.

These experiments suggested that the organism very likely had a selective function or an elective localizing power. As for the proof of the above, the bacteriologists tell us that the streptococcus hemolyticus showed a marked affinity for the joints, and the streptococcus viridans for heart valves, producing endocarditis without joint changes. The pneumococcus produced neither of the above, but pneumonia.

Rosenow, wishing to prove the selective properties of the streptococcus, took a number of strains from the appendix and injected them into animals, and at the same time injected into other animals the streptococcus obtained from organs other than the appendix. He found that in the former selection 68 per cent. showed some change around the appendix, as against 5 per cent. in the latter selection. Similar experiments were carried out obtaining streptococcus from other organs with about equal results. These and other results obtained by Rosenow suggested that localization depended on:

1. Virulence—as germs isolated from the appendix have a low virulence, from the gastric ulcer more virulent, and gall-bladder still more so.

2. Individual variation—as to resistance, such as tetanus toxin, has a selective power for the motor ganglion cells; diphtheria bacilli

for the faucial tonsil; typhoid bacilli for the lymphatic tissue, etc. The heart valves are selected by an organism of low virulence, such as the streptococcus viridans, but the kidney and lung are favorable to the higher virulent organisms like the pneumococcus.

3. The amount of oxygen to the part—As in the above class, the lung and kidney have a greater supply of oxygen than the heart valves or the joints.

4. Tissue or organs.

5. Circulation.

6. The laws governing chemicals when injected into animals, as the amounts to the various organs may differ.

There seems to be a greater tendency for non-virulent organisms isolated from chronic lesions to show selective properties. The local types of the infections of most interest to the dentist are those around pyorrhoea pockets and alveolar abscesses, especially the non-fistulous type. Clinical evidence bears out the facts that the general symptoms, such as joint complications, frequently disappear when the septic foci are eradicated. By far the most common sequela following dental infection is osteitis, occurring more in the upper maxillary bone, due to its very cancellous structure. In most of the cases the immediate subjective signs have no relation to the area of degeneration, owing to the few nerves and blood vessels of any size or importance in that region.

Obituary

GEORGE A. RICHARDSON, D.D.S.

AFTER an illness extending over a period of six weeks Dr. George A. Richardson passed away as a result of septicemia. The late Dr. Richardson practised his profession on Bloor Street, Toronto, from 1888, excepting for a short period spent in Stratford immediately following his graduation.

Besides his wife, Fannie Marshal Richardson, he is survived by two sons, who are at the front, and his brother, Col. T. B. Richardson, formerly in command of the Base Hospital. Lieut. Frank Marshall Richardson, with the 58th Battalion in France, and Lieut. George Radford Richardson, with the C.F.A., Kingston, are the sons of the deceased. He was a son of the late Rev. George Richardson, a Methodist minister, who died here some years ago. Dr. Richardson was a prominent member of Central Methodist Church and an active worker in the Young Men's Christian Association, and will be greatly missed by his many friends and confreres in the city of Toronto.

Board of Education, Toronto

ANNUAL REPORT, 1916, OF CHIEF DENTAL OFFICER,
WALLACE SECCOMBE, D.D.S.

To the Acting Chief Medical Officer,
Board of Education, Toronto.

Dear Doctor Minns:

I have the honor to present the following report upon the work of the dental staff covering inspection of Public School scholars and operation of school dental clinics for the year ending 29th December, 1916.

A complete dental survey of all the city schools was made in October, 1916, for the purpose of securing information concerning the number of scholars with defective teeth and the extent and character of the defects, that the problem of their correction and the prevention of their recurrence might be solved in the best possible way.

Notification cards have been sent to parents able to care for these conditions through the ordinary channels. Your dental officers have endeavored, with the valuable assistance of the school nurses, to follow up, with equal interest, cases of all children, whether of the poor or well-to-do. Frequently children of the wealthy citizens have been found to suffer serious dental trouble through home carelessness. These cases have been persistently followed up until completed by the family dentist.

DENTAL DEFECTS.

Perhaps the most striking example of the excellent results of school dental treatment is shown in the steady reduction in the number of Toronto scholars suffering dental defects. Statistics gathered from many widely separated points show that in the average community the percentage of school children with dental defects ranges from 85 per cent. to 95 per cent. In the city of Toronto, just previous to the organization of school clinics, 95 per cent. of children comprising Church and Elizabeth Street schools, were found to be afflicted with dental trouble. Subsequently, in 1915, examination of the scholars in 86 schools showed that the percentage of children with dental defects had been reduced to 65 per cent. This percentage, covering all the schools in the city, has now been actually reduced to 51 per cent. It is doubtful if any other city of equal size can show such favorable conditions in this regard as does Toronto. Forty-nine children in 100 are absolutely free from dental defects, exclusive of cases of irregularity of teeth.

PERCENTAGE OF SCHOLARS WITH DENTAL DEFECTS, AS SHOWN BY DENTAL SURVEY, OCTOBER, 1916.

SCHOOLS IN ORDER OF MERIT.

1. Allan	28%	42. Carlton	54%
2. Fern	31%	43. Earls court	54%
3. Joseph Workman	32%	44. Rose Ave.	54%
4. Queen Victoria	35%	45. Western	54%
5. Lee	36%	46. King Edward	55%
6. Dewson	39%	47. Humewood	55%
7. Rosedale	40%	48. Cottingham	56%
8. Parkdale	41%	49. Grace	56%
9. Keele	43%	50. Victoria	56%
10. Alexander Muir	43%	51. York	56%
11. Wellesley	44%	52. Williamson Road	57%
12. Shirley	45%	53. Eglinton	57%
13. Hester Howe	45%	54. Manning	57%
14. Palmerston	45%	55. Hillcrest	58%
15. Givens	46%	56. Orde	58%
16. Clinton	47%	57. Perth	58%
17. Brock	47%	58. Regal	58%
18. Wilkinson	48%	59. Brant	59%
19. McMurrich	48%	60. Pape	59%
20. Queen Alexandra	48%	61. Kew Beach	59%
21. Essex	49%	62. Howard	60%
22. Church	49%	63. Davisville	60%
23. Kimberly	49%	64. Deer Park	60%
24. Lansdowne	49%	65. Sackville	60%
25. Niagara	49%	66. Strathcona	61%
26. Huron	50%	67. Coleman	61%
27. Ogden	50%	68. Duke St.	61%
28. Earl Grey	50%	69. Duke of Connaught	62%
29. Brown	50%	70. Kent	62%
30. Dovercourt	50%	71. Annette	63%
31. Ryerson	50%	72. Hodgson	63%
32. Leslie	52%	73. Dufferin	63%
33. Roden	52%	74. Norway	63%
34. Winchester	52%	75. St. Clair	64%
35. Frankland	53%	76. Jesse Ketchum	65%
36. Bolton Ave.	53%	77. Park	65%
37. Balmy Beach	53%	78. John Fisher	66%
38. McCaul	53%	79. Pyne	66%
39. Hughes	53%	80. Pauline	69%
40. Morse	54%	81. Runnymede	71%
41. Bedford Park	54%	82. George	76%

According to school grade the percentage of children with defective teeth are as follows:

Senior 4th	37%
Junior 4th	40%
Senior 3rd	44%
Junior 3rd	47%
Senior 2nd	52%
Junior 2nd	57%
Senior 1st	50%
Junior 1st	69%
Kindergarten	67%
Average	51%

The two senior classes in the schools are thus shown to be 13 points above the average, while the two junior classes are 17 points below the average. These conditions indicate the pressing need for further educational work in the home and greater co-operation between the home and the school in matters of oral hygiene. It is to be noted that the junior classes are graded lower both in the matter of defects and in cleanliness than the more senior classes. There is a marked tendency toward improvement as the school influences become more and more operative.

ORAL HYGIENE GRADING.

The scholars were graded in May and again in October, according to conditions of oral cleanliness. Too much credit cannot be given the teachers for their active co-operation by checking up, in the class room, the daily care of the mouth. There has been an average improvement in oral cleanliness throughout all grades of sixteen points. The average standing is now 1.56, as against 1.72 last May. The same standard was used, namely:

1.	Excellent
2.	Good
3.	Fair
4.	Poor

The improvement according to school grade is as follows:

	Present Oral Hygiene Grade.	Improvement Over May last.
Senior 4th	1.37	15 points
Junior 4th	1.44	17 "
Junior 2nd	1.46	26 "
Senior 3rd	1.51	18 "
Junior 3rd	1.55	18 "
Senior 2nd	1.59	18 "
Senior 1st	1.64	16 "
Junior 1st	1.72	1 "
Kindergarten	1.79	11 "

In so far as individual schools are concerned the greatest improvement in oral cleanliness was shown in Norway school (97 points). This school was at the bottom of the list in May, and showed such marked improvement as to be now numbered among the leading schools. Other schools showing large gains are Dufferin 75 and Williamson Road 74 points.

SCHOOLS IN ORDER OF MERIT.

Name.	O.H. Grade, May, 1916.	O.H. Grade, Oct., 1916.	Per Cent. Gain.	Per Cent. Loss.
1. Duke	1.04	1.01	.03	..
2. Sackville	1.08	1.02	.06	..
3. Niagara	1.26	1.09	.17	..
4. George Street	1.85	1.18	.67	..
5. Queen Alexandra	1.52	1.19	.33	..
6. Bolton	1.49	1.21	.28	..
7. Lee	1.40	1.24	.16	..

8. Alexander Muir	1.73	1.25	.48	..
9. Dufferin	2.01	1.26	.75	..
10. Park	1.06	1.26	..	.20
11. Eglinton	1.59	1.27	.32	..
12. Brown	1.25	1.27	..	.02
13. Deer Park	1.63	1.28	.35	..
14. Keele Street	1.19	1.32	..	.13
15. Earl Grey	1.36	1.32	.04	..
16. Norway	2.30	1.33	.97	..
17. Withrow Avenue	1.34	1.34	..	..
18. Crawford	1.73	1.36	.37	..
19. Hughes	1.89	1.37	.52	..
20. Carlton	1.88	1.40	.48	..
21. Williamson Road	2.15	1.41	.74	..
22. Annette Street	1.32	1.41	..	.09
23. Allan	1.60	1.43	.17	..
24. Givens	1.66	1.43	.23	..
25. Manning	1.47	1.44	.03	..
26. Frankland	1.84	1.44	.40	..
27. Essex	1.48	1.44	.04	..
28. Bedford Park	1.56	1.45	.11	..
29. Roden	1.22	1.46	..	.24
30. Humewood	1.86	1.47	.39	..
31. Kew Beach	1.81	1.48	.33	..
32. Brock Avenue	1.66	1.50	.16	..
33. Sackville Annex .....	...	1.52	..	..
34. Pape	1.40	1.52	..	.12
35. John Fisher	1.58	1.53	.05	..
36. Dewson Street	1.50	1.53	..	.03
37. Western Avenue	1.61	1.53	.08	..
38. Balmy Beach	2.00	1.53	.47	..
39. Duke of Connaught	1.31	1.55	..	.24
40. Strathcona	1.83	1.55	.28	..
41. Runnymede .....	...	1.55	..	..
42. Kimberly	2.11	1.56	.55	..
43. McMurich	1.61	1.57	.04	..
44. Winchester	1.80	1.57	.23	..
45. St. Clair Avenue	1.40	1.57	..	.17
46. Kent	1.43	1.58	..	.15
47. Dovercourt	1.63	1.58	.05	..
48. Hester How	2.08	1.59	.49	..
49. Perth Avenue	1.99	1.60	.39	..
50. Ryerson	1.70	1.60	.10	..
51. Hodgson	1.88	1.60	.28	..
52. Rose	1.90	1.61	.29	..
53. Cottingham	2.22	1.61	.61	..
54. Rosedale	1.66	1.64	.02	..
55. Church	1.91	1.65	.26	..
56. Earls court	2.07	1.66	.41	..
57. Ogden	1.60	1.67	..	.07
58. Regal	2.27	1.67	.60	..
59. Morse	1.70	1.67	.03	..
60. Coleman Avenue	2.23	1.68	.55	..
61. Kitchener	1.81	1.69	.12	..
62. Orde	2.09	1.71	.38	..
63. Wilkinson	1.71	1.72	..	.01
64. Joseph Workman	1.77	1.72	.05	..
65. Victoria	2.23	1.73	.50	..
66. Howard	2.10	1.75	.35	..
67. Hillcrest	1.66	1.75	..	.09
68. Queen Victoria	1.70	1.77	..	.07

69. McCaul	1.98	1.78	.20	..
70. King Edward	2.20	1.79	.41	..
71. Palmerston	2.20	1.80	.40	..
72. Fern Avenue	1.90	1.80	.10	..
73. Leslie	1.60	1.82	..	.22
74. Wellesley	2.27	1.85	.42	..
75. Pauline Avenue	1.44	1.90	..	.46
76. Huron	2.09	1.91	.18	..
77. Davisville	1.76	1.92	..	.16
78. Parkdale	1.90	1.93	..	.03
79. Jesse Ketchum	2.10	1.95	.15	..
80. Shirley	2.07	1.98	.09	..
81. York	1.08	2.00	..	.92
82. Pyne	2.06	2.04	.02	..
83. Clinton	2.14	2.06	.08	..
84. Lansdowne	2.13	2.13	..	..
85. Grace	2.15	2.20	..	.05
86. Brant	2.20	2.20	..	..

REPORT OF DENTAL WORK FOR 1916.

	Children Relieved of Toothache	Number of Completed Cases.	Total Operations.
January	229	571	4,680
February	293	715	6,161
March	325	698	6,797
April	162	473	5,529
May	191	497	11,106
June	168	326	9,099
September	227	605	5,789
October	296	596	5,856
November	217	606	4,732
December	239	643	4,981
	2,347	5,730	64,730

HOME AND SCHOOL MEETINGS.

Your chief dental officer has addressed during the past year a great number of parents' meetings, held in the school buildings in almost every part of the city. Most of these meetings were arranged for by the principal, with the assistance of the school nurse, and were held in the afternoon after regular school hours.

These gatherings have proved of the greatest value in securing the intelligent co-operation of the home in those phases of the dental problem bearing upon tooth development, diet, mastication and oral cleanliness. Where possible, lantern slides were used for purposes of illustration. In every case some phase of the question of the prevention of dental disease was discussed, and it is expected that the more sympathetic co-operation of the home along these lines will show in further improved dental conditions in the years to come.

THE PORTABLE DENTAL CLINIC.

The central thought in school dental work this year has been that of prevention. Perhaps the most important move in that direction was the organization, early in the year, of a portable dental clinic.

This clinic started operation in Sackville school, and has since gone from school to school, instituting two or three weeks of general dental prophylaxis and instruction. The object of the portable clinic is that an examination be made of the mouth of each scholar and prophylactic treatment and instruction given, so that each child will not only be shown how, but will be encouraged to keep the teeth and oral cavity in a condition of health.

At present the city is divided into fifteen dental districts with one dental centre in each. An ideal arrangement would be to have a dental clinic in each school, thus saving a large portion of the loss of the child's time from class-room work, and also enabling better control and follow-up service. With a clinic in each school the dental officer could report at the different schools in his district upon days to be arranged, and thus avoid the necessity of the child leaving the school building. Under the present system all of the scholars treated in over 80 per cent. of the schools are required to walk to the nearest dental centre for treatment.

The demand for the portable clinic from the principals of the different schools has been most urgent, not only because of the need, but also because the need could thus be supplied without the scholar leaving the school building. To meet the situation it was decided to move part of the equipment of each regular dental clinic to other schools of the district for this special service, and this, in some measure, accounts for the improved dental conditions in the schools.

IMPORTANCE OF PREVENTION.

Recent scientific investigations have established conclusively that infection lodged in and about the roots of teeth reaches the general circulation, and may result in many systemic conditions, such as rheumatism, heart, kidney, stomach, and other diseases. The results of dental disease being, in many cases, so serious, the greatest possible attention is now being paid to educational work along oral hygiene lines, with a view to the prevention of these conditions.

Almost without exception the teachers have gladly co-operated with the school dentist and nurse, and are inaugurating some form of systematic follow-up that will go far toward ensuring that the mouths of the pupils be maintained in a condition of cleanliness and health. In each case the plan followed by the teacher is that best suited to the particular age or grade of the scholar, and the improvement already accomplished by many of the teachers in this way is most encouraging.

ACTIVE CO-OPERATION.

Splendid progress has been made in dental work during the past year because of the active and enthusiastic co-operation of parents, principals, teachers, nurses and physicians with the dental officers. Members of the dental staff have been most faithful and loyal in

their work, and have shown their keen interest by giving one week of free voluntary service during the summer vacation months. Permit me also to express the appreciation of the dental staff for your personal assistance during the year, and the unfailing courtesy of the clerks in the department.

Respectfully submitted,

WALLACE SECCOMBE,
Chief Dental Officer.

The Surgical Treatment of Abnormal Edentulous Mouths and Facial Restorations With Artificial Dentures*

JAMES P. RUYL, D.D.S., NEW YORK.

AMONG many things which come to our notice, in connection with daily practice, are certain abnormalities which occur in front teeth in their relation to the upper and lower jaws. How often do we find mouths with partial dentures replacing the lost bicuspid and molars, where the anterior uppers or lowers (in most cases the uppers) stand out of position, with consequent protruding lips, because of faulty occlusion—an unsightly condition, making a person plain who might otherwise have been good looking. And how many times have we seen plates worn which constantly move while the wearer was talking. Again, patients have come to us who, in want of plates, show their gums during ordinary lip movement, and when we are called upon to make plates for them we wish they had never found our office, or we send them to the other man, so that when relatives or friends inquire who made their plates the blame may not rest on us. We have all noticed these unsightly mouths as we went through the streets or sat in front of them in street cars, and we always inwardly hoped that nothing similar would present themselves to us.

Perhaps just as well here as anywhere a far-reaching ethical point may be touched upon. I refer to these tragedies of sensitiveness which abnormalities of any kind bring about. Doubtless all of us have noticed how people with bodily defects have held back, painfully conscious, from mingling with others, and the happiness, and freedom of spirit, and even the progress of the individual has been impaired. I have known patients to cover their mouth with their hand, and even to refrain from smiling; and I myself have rejected an otherwise competent applicant for work because of some dental defect.

*Read before the Toronto Dental Society Monday, 22nd January, 1917.

Now, for convenience, I will divide the conditions which arise from these abnormalities into four general groups. It is my intention to state them with their causes, and to give an effectual method of correction.

The first and most common one we come across, and one of the most difficult to rectify unless properly done, is that condition which is brought about because the patient has only six or eight natural anterior teeth—bicuspid and molars being gone—and has worn an upper plate for many years. In his endeavor to reach for food while chewing these lower natural teeth have gradually become loosened and elongated, and there has been a marked forward movement of the process and of the teeth, with a consequent thick lower lip and the appearance of a protruding lower jaw, resulting in the extreme cases of pyorrhoea. In such mouths, that have worn a plate for a long time, great absorption takes place in the upper front jaw caused by the constant hammering of the lower teeth upon it, and the uppers disappear so much that they cannot be seen, giving one the impression that there are no teeth in the upper jaw at all. If you wished to make an upper plate for some one having conditions in the lower jaws, as I have just stated them, you could not make one that would be right, because the lower teeth have grown up so high that they extend above the line of the occlusal plane, often as much as an eighth of an inch. If you set the centrals and laterals of the upper plate their proper length—about one-sixteenth of an inch below the upper lip line—you would then create a condition where the patient could not close his lips. Now if you wanted to continue and make the lips meet, and you did not make a correction in the lower jaw by removing the lower teeth and process, you would have to set the uppers so high that there would be an appearance of no teeth in the upper jaw, and the result would be a sagging of the mouth, changing what was animated and pliant into a set, stern and aged condition. My point is, without removal of the teeth and an operation you could not relieve the abnormality.

Next there is the abnormality due to a natural condition where the gums are long and the lips are short. People with this kind of mouth are generally discouraged with their appearance, and conscious of their defect and hopeless of making any improvement, are prone to neglect their teeth, even to necessary fillings. They lose them early, and the dentist, making a plate, fits teeth to the same length of gum, usually with no rubber against the ridge. The teeth must be ground right up to the gum, and in a short time there is an unsightly space between it and the teeth. Such a plate is very difficult to hold in place and get any degree of comfort in mastication.

The third abnormal condition, due to adenoids, thumb-sucking and irregularities is a pointed arch, with teeth slanting forward, and when they come to us there is no longer any possibility of regulation,

usually because there are too many teeth gone, or the patient is too old and cannot give up the time.

The fourth abnormal condition is the one where plates have been worn for many years, and where the process has entirely absorbed, leaving a soft, flabby ridge. When it falls to some dentist to make a plate for a mouth of this kind, he, to make a good fit, puts in an extremely deep air chamber, which causes the mucous membrane to pull down and form a cauliflower-like appearance of the tissue, and because of a consequent increased flabbiness, not only of the ridge now, but also of the palatal portion, he gets more movement of the plate than before.

All these conditions must be treated surgically. To leave an unsightly condition, or to augment it, as most dentures will in an abnormal mouth, is not doing justice to a patient. As much as the superfluous process must be removed as will, in your own judgment, restore a natural comeliness and, in many cases, an increased comeliness over nature. Even after the removal of a tooth, in cases where you do not expect to make a facial restoration, it would be advantageous both to dentists and patients if, at the time of extraction, the sharp pieces of process that remain where the cervical border of the tooth was, were removed. This is often the case with the cuspid tooth, where the process is a little thicker and more prominent. By so doing you not only hasten the time for the impression, but also save the patient many hours of pain. The sharp prominences that are left by not removing the process are troublesome in eating, etc., and the thin membrane that stretches over it is only a slight protection to the process underneath, and makes it consequently very susceptible to pain. Those cases with very soft ridges and no process underneath—the process being entirely absorbed—must be treated surgically also, by removing the tissues until such a time as the membrane will just make a thin portion over the bone. By so doing you get the mouth into a condition where the plate rests on a solid foundation, and so prevent its shifting, which would not be the case if the soft tissues were left. It is the same principle as trying to build a house upon a sand foundation. The operation is so simple, so easily done—only an obstruction to remove—that it would seem more natural to do it than not to do it.

With the exception of that condition where there is soft membrane, all the abnormalities caused by bony prominences are treated in the same way. A general or local anaesthetic can be used. My local anaesthetic is: Cocaine Hydro., gr. 5; Ac. Boric, gr. 5; Sod. Chlor., gr. 5; Sod. Adren. Chlor., m.; 10 drops Aqua. List. q. s. vid., oz. 1.

The injections are made labially and palatally. Loosen the gum around the teeth with a lance and extract them. If it is necessary to operate in both jaws, make the injections in the upper and lower at once and operate on the bone only in one jaw, and when that is



Woman of 34 years having six anterior teeth in each jaw, with a marked protrusion, and showing her gums during ordinary lip movement. There was an accentuated migration of these teeth and enlargement of the process, due to continued mastication on these front teeth.

Same woman with full permanent dentures in place six weeks after the extraction of her teeth and the removal of one-quarter inch process from upper and lower jaw. The distance from nose to point of chin lessened one-half inch, thereby making a much improved cosmetic effect.



The above illustrates a full upper denture which had been worn for 12 years with a few remaining anterior teeth. These had an excessive forward movement due to the continued hammering against the upper plate and thereby creating a pronounced resorption of the upper anterior process.

The same man after the removal of lower teeth and process with full dentures in place and a pleasing facial restoration.

finished, remove the teeth from the other jaw and operate there. My reason for working in this way is to avoid a sponging of blood in places where you are not operating. After removing the teeth, place a blunt instrument about a quarter of an inch wide, shaped somewhat like an ordinary wax spatula, between the process and the gum, and by leverage, using the process as a fulcrum, tear the muco-periosteum away, leaving the bone perfectly clean. This is easily done, far more easily than dissecting the gum, and causes much less bleeding. Now hold the gum flap back, and using a bone forcep, or better still, a curved wedge cutter, cut off as much process as is necessary. The sharp edges which are left palatally and labially must be rounded off with a bur or an engine stone. Apply water with a syringe while doing so. You will now have flaps of gum hanging down anteriorly and posteriorly, and you can very easily cut them off with a gum scissors. Remove enough gum tissue, so that the parts will not quite unite, when pressing together with the finger and thumb—about a sixteenth to an eighth of an inch. By thus not allowing the membrane to come together absolutely, you will find when the healing takes place that the gum reaches over the bone and leaves a firm healthy ridge. It is not necessary to put in sutures at any time. Absolute healing takes place, and in a month to six weeks permanent plates can be put in. I have taken impressions for temporary plates in five to ten days after such operations, and they were worn from one to two years. In the operation for cases where there is a pointed arch it is generally only necessary to remove the outer plate of process in order to get the lip back to normal. One need not cut off the whole process—only the front part—because in this case you do not show the gum so much; you only want lip restoration.

For the operation upon soft, flabby ridges, inject in the same manner. Instead of beginning at one side of the ridge and cutting clear across to the other side, begin in the centre of the soft tissue and cut both ways, because by so doing you prevent the flaps from getting in the way while you operate. In these cases healing takes place so rapidly that impressions can be taken in a week or ten days. The cauliflower-like appearance of the soft tissues, caused by extremely deep air chambers, is removed in the same way, except that a curved lance is used. Shave down to the periosteum.

Such radical changes very often bring us into difficulties with members of a patient's family, because they have become so accustomed to the old expressions that, when a correction is made, even though the expression be markedly improved, it is often very hard to get them to consent to a change. However, if a proper plate, producing adequate restoration, is worn for a week or so, the change for the better is so quickly taken up by the rest of the family that if the old plate were then put in they would not accept them for a moment.

It seems to me that this work has brought me more satisfaction than any I have ever done. To overcome difficulties which have usually been neglected, and to bring to a successful issue what was formerly a bug-bear, should, of course, give one great pleasure, but more than all this to me is the joy I have felt in seeing my patients so well satisfied and knowing that I have given them perhaps more than mechanical service.

Oral Hygiene and the Daily Press

THE *Philadelphia North American* ranks health as the first consideration in all that concerns public welfare and mass progress, and believes that it is the duty of every newspaper to help in work of this sort. For many years the *North American* has devoted much space to the presentation of easily comprehended facts relating to the progress of science against disease.

In a recent issue the Editor declared that,—

“At the present moment, science has come up against the ivory wall of the teeth. Suddenly it has revealed to us the mouth—the upper opening of what actually is the channel of life—as a source of disease in a way quite different from that heretofore known.

“Always it has been known that the body might suffer from what entered it through this opening, and of late years the public has been protected against impure foodstuffs and poisons.

“Later we come to understand the health value of proper mastication. And now we are being shown that it is not alone what goes into the mouth and is chewed by the teeth that regulates our physical well-being; but what stays in the mouth, between the teeth, to decay and cause decay and thus lead to conditions favoring bacterial growth.

“Perhaps no phase of scientific research shall have produced larger benefits than this, once it has fully expanded.”

As a sample of the articles published from time to time by this newspaper, we reproduce herewith a clipping taken from a recent issue:

HOW ARE YOUR TEETH?

For the reader who might view such a question as an intrusion on personal privacy, we here repeat an interesting—and true—little story recently printed in our news columns.

Down in Milford, Del., a company of the national guard assembled to answer the president's call.

On physical examination, more than half its members were rejected. At once was started an automobile canvass to round up recruits and fill the depleted ranks.

More than enough substitutes were found, but it was evident that

most of these would be rejected because of the condition of their teeth.

Two officers of a dental supply company in Milford and two local dentists volunteered to do what they could. After a whole day of hard work, they got the defective mouths fixed up temporarily.

"The teeth of virtually every one of the men who received treatment were in such shape that two months' stay on the border would have resulted in sickness for all of them," said one of the experts, at the close of the strange clinic.

He did not mean toothache or swollen jaw. Such ailments yield to simple treatment, as a rule.

But it might be rheumatism or indigestion, tonsilitis or anemia or even tuberculosis or some malignant stomach growth. Naturally, these affections have varying periods of development, but in the estimation of some of the ablest medical experts, their attack and progress often are due to decayed teeth and resulting bad mouth conditions.

As a matter of fact, wideawake doctors everywhere are coming to look at patients' teeth in much the same way that old-time practitioners examined the tongue. For one of the most notable advances in the recent history of medical science is based on a growing conviction, backed by widespread experience, that the general state of health is largely controlled by the condition of the teeth and gums.

So renowned an authority as Dr. William Mayo has said that the next great field for surgery is the mouth; that when the relation between its condition and that of the rest of the body is more fully understood, human ailments may be reduced to a minimum beyond any yet approached.

Dr. Edward Carl Rosenow, who, as bacteriologist, is associated with the Mayo brothers in their world-famed hospital at Rochester, Minn., has definitely traced a direct relationship between pus in tooth sockets, behind badly placed fillings, and diseased tonsils, inflammation of the heart-lining and chronic rheumatism of the joints.

In some of the rheumatism cases the site of the trouble is so far removed from the infected tooth—knee-joint or ankle, for instance—that one not on the lookout for the particular source would never think of connecting the swollen, painful joint with tooth trouble—and painless tooth trouble, at that!

Yet, in conjunction with experimental work by Dr. Frank Billings and other leading Chicago doctors, Rosenow has been able to develop from pus taken from human mouths a whole chain of micro-organisms—mostly streptococci—which seem to have a curious selective action for certain parts of the body.

For, when injected in experimental animals, some of these invariably attack the appendix, while others produce gastric ulcers or infect the gall-bladder or inflame the lining of the heart.

In the case of tuberculosis, according to Kellogg, the tubercle bacilli

travel around the root of the decayed tooth to the lymphatic glands of the neck, whence they gain access to the general system, or directly attack the nearest apex of the lung.

So it seems to be reasonably proved that one of the best ways to prevent many common diseases—and among them some of the most disastrous—is to take care of the teeth and keep them in good condition. And that one of the effective means of relieving these diseases is through proper attention to and treatment of decayed teeth or diseased gums.

Heating and Ventilation

HEALTH BULLETIN, DEPARTMENT OF PUBLIC HEALTH,
TORONTO.

THE SCIENTIFIC FACTS OF THE MATTER.

WHY does an enclosed atmosphere, vitiated by the presence of human beings, produce headache, depression, flushed face, nausea, etc.? Three explanations have been offered:

- (1) Increase of carbon dioxide and diminution of oxygen.
- (2) Poisons in the expired breath.
- (3) Physical changes in the air.

Let us briefly examine each of these explanations.

(1) Ordinary air contains about 20 per cent. of oxygen and 3-100 of one per cent. of carbon dioxide. It has been shown that an atmosphere containing only 15 per cent. of oxygen and as much as 2 to 4 per cent. of carbon dioxide may be endured without harm. This represents a vitiation much beyond anything possible in ordinary human habitations. Carbon dioxide is in itself well known to be harmless. In the process of brewing, large quantities of carbon dioxide are evolved. The air of breweries contains 1.5 to 2.5 per cent. of carbon dioxide (and even as high as 6 per cent. at times), and men work in this for years without ill-effects.

(2) The question of poisons being present in expired air has been investigated by numerous physiologists and "there is no present proof that the expired air contains a poisonous substance."

If rabbits are confined in a series of jars connected with rubber tubes so that a current of air may be passed, the rabbit in the last jar, which has received the expired air from the lungs of all the other animals, suffers no untoward symptoms if the atmosphere in the jar is kept within proper limits of humidity and temperature.

(3) The failure to prove propositions 1 and 2 has in recent years focused attention upon the physical changes, such as the increase of humidity, increase of temperature and stillness of the air in a poorly ventilated room.

Paul placed healthy individuals in a cabinet of three cubic metres capacity for periods up to four hours. After a time symptoms of headache, dizziness and depression were observed. Those in the cabinet were then allowed to breathe the fresh outside air through a tube, but this gave no relief; nor did the air of the cabinet produce any symptoms when breathed through a tube by a person outside.

But the discomfort experienced by those within the cabinet could be almost instantly relieved by any one of three procedures: (a) drying the air in the cabinet, or (b) cooling it, or (c) stirring it up by means of a fan, none of these procedures involving any chemical change in the air. The explanation underlying the foregoing observation is as follows: Normally, a certain heat interchange occurs between the human body and the air surrounding it. That this interchange may take place with the greatest facility, the air must be (a) in movement so that the atmosphere surrounding the body is changed as fast as it is heated; (b) it must be cooler than the body so that heat may be lost by radiation, and (c) it must be relatively dry so that heat may be lost by evaporation of body moisture (perspiration).

The vitiated atmosphere of a densely populated, poorly ventilated room fails to provide any one of these conditions. The temperature is high, the humidity is high, and there is little air movement. As a result, the body is surrounded by a stagnant aerial envelope of such a temperature and such a humidity that heat is lost with great difficulty. This difficulty, in maintaining the normal heat interchange, upon which comfort depends, is expressed symptomatically as headache, flushed face, depression, nausea, etc.

Summary.—It is now perfectly plain that the ill-effects resulting from vitiated atmosphere are not due to an increase of carbon dioxide, a decrease of oxygen, or to poisons in the expired breath.

Most at least of the discomfort is due to physical changes in the air. If a normal heat interchange can be maintained between the body and the air, the symptoms commonly attributed to vitiated air do not develop.

One more word before passing on to the subject of heating and ventilation. A reasonable supply of fresh air is necessary at all times. This has been demonstrated over and over again in the case of horses, cattle and dogs, as well as with men confined in badly ventilated barracks, jails and other places. Thanks to the tuberculosis propaganda, the importance of fresh air is now appreciated by most people.

THE APPLICATION OF THE SCIENTIFIC FACTS.

Heating and ventilation go hand in hand, and ordinarily they are extremely defective. Heating and ventilation should provide:

1. An adequate supply of fresh air.
2. A proper temperature, say 65 degrees to 68 degrees Fahrenheit.

3. A proper degree of humidity, say 50 to 65 per cent. of all the moisture the air will hold at 65 degrees Fahrenheit.

4. A reasonable air movement.

Fresh Air.—Except for hot air heating systems with the inlet outside, no house heating system in ordinary use has any provision for supplying fresh air. The fresh air that reaches the ordinary home enters through cracks around doors and windows, through the porous materials of which houses are built, and through open doors and windows. In short, fresh air reaches the ordinary home in winter by accident rather than design.

Temperature.—The temperature of most houses is kept too high. 65 degrees to 68 degrees Fahrenheit is about right, instead of 70 degrees to 75 degrees Fahrenheit, which is common. If the humidity is about right, a temperature of 65 degrees Fahrenheit is just as comfortable as a temperature of 70 degrees Fahrenheit with the humidity low. Appreciation of this fact will lower the coal bill.

Humidity.—In the matter of humidity, the great majority of houses offend very seriously. Most indoor air is far too dry. The humidity should be from 50 to 65 per cent.; usually it is 40 per cent. or below. In hot air furnaces a water pan is provided, but it is often empty and inadequate in any case. Hot water and steam heating systems are still worse; they have no provision whatever for adding moisture to the air. This dryness of the indoor air is the cause of the dry, hacking laryngeal coughs so common in the winter time. The dry air craves moisture, and extracts it from all sources available, including the skin and mucous membranes of human beings. The correction of low humidity is not easy. The water pan of hot air furnaces should be kept filled. Plants scattered about a house, and watered daily, help to some extent. A kettle kept simmering in the kitchen all the time improves matters a great deal. Shallow pans filled with water and placed on radiators and registers will evaporate considerable quantities of water. Even if the pans are in rooms not used much, they will improve the general atmosphere of the house if the doors are kept open.

Air Movement.—All systems of heating cause some air movement. Open windows, open doors, and grate fires also promote air movement. An air current moving at a rate of one mile per hour is not perceived by the human skin as a draft. Air movement is important; at least part of the benefit derived from a sojourn at seaside and mountain resorts is due to the stimulating effects of the breezes blowing almost constantly at these places.

Open Windows.—The one effective system of ventilation within the reach of all, and costing nothing, consists in opening windows. Cross ventilation by means of two windows, or a window and a door on opposite sides of the room, is particularly effective. In any case, just opening enough to produce a nice current is all that is required.

The extent to which windows are opened in sleeping apartments must depend on atmospheric conditions. Naturally one would have a window open wider on a calm night than on one that was blustery and with the wind in such a quarter that it would blow directly in the opening.

Every one should sleep in a room with open windows. Regardless of day time conditions, fresh air is available to everybody for eight solid hours every night.

An excellent method of ventilation is to place in an open window an ordinary window screen frame covered with cheese cloth instead of screen wire. This arrangement breaks up wind and keeps out snow, and the heat loss is very little greater than the loss by radiation from the surface of the panes of glass in a closed window.

A New Antiseptic

FROM the beginning of the war search has been made for the ideal antiseptic. This must satisfy two conditions—it must be powerful enough to kill the germs of infection in wounds, and yet be as harmless as possible to the tissues. In particular, it must be innocuous to the leucocytes, which are essential to maintain phagocytosis, and to the destruction of pathogenic germs. The leucocytes also contain a substance, trypsin, which, when liberated into the blood-stream, lowers the power of the blood to destroy bacteria. If the leucocyte is killed its trypsin escapes and neutralizes the anti-tryptic power of the blood fluid, so making a good field for the germs of the blood poisoning to work in. Many of the older antiseptics actually damage or destroy the white corpuscles. It is claimed that the new antiseptic is free from these disabilities. This is fully described in the *British Medical Journal* by Dr. Browning and others who have assisted him in his research work, and it should prove of value to dentists engaged on war work upon jaws. The drug is called “flavine,” from its yellow color. It kills the germs causing ordinary abscesses in solutions of 1 in 200,000, but to stop the activities of the white blood corpuscles it is necessary to use a solution 400 times stronger, that is, 1 in 500. Carbolic acid, on the other hand, prevents the activities of white blood corpuscles in solutions of 1 in 500, but will not kill germs until the strength of 1 in 250 has been reached. That is to say, in order to get a solution of carbolic acid which will kill germs it has to be made twice as strong as one which interferes with the good work of the white blood corpuscles, whereas “flavine” kills germs when it is 400 times weaker than the strength required to prevent the work of the white corpuscles. It belongs to a group of bodies such as “brilliant green,” and the initial report encourages us to believe it will prove of great value.—*British Journal of Dental Science.*

HORTICULTURE AS A HOBBY FOR THE DENTIST

FRED. G. BRETHOUR, D.D.S.
Spadina Ave. and College St., Toronto

ORAL HEALTH WILL BE PLEASED TO HEAR OF HORTICULTURAL
SUCCESES OR FAILURES AND OF YOUR GARDEN PLANS FOR THE
FUTURE. SUGGESTIONS OR QUERIES WILL BE GLADLY RECEIVED
FOR DISCUSSION IN SUBSEQUENT ISSUES.

Delphinium

NEXT to the rose, peony and iris, the delphinium is, to my mind at least, the most beautiful of hardy garden flowers. It is most useful in the border on account of its color, its height, the duration of its bloom, and its long spikes. Its foliage, too, which is dense and a good green, makes a splendid background for other lower growing flowers of a harmonizing color. Although the delphinium is such a tall growing plant, even growing to a height of eight or nine feet, I do not consider it wise to place it at the immediate back of the border. To show it off to the best advantage, it requires a background of shrubs, or low growing evergreens, or if these are not available, place some other tall late flowering plants at the back, for the delphinium blooms in July, and after the flowering season is over, the stalks become unsightly and are cut down. It is better, then, to group your plants of at least eight or ten, in some irregular fashion, from somewhere near the back of the border to a couple of feet from the front. Do not plant in a straight row. Arrange so that the lower growing ones are in front. The varieties run from about three to nine feet in height. If such a clump is placed, say about one-third of the distance from the far end of the border, it has a most beautiful effect, for the tall blue spikes seem to lengthen out the perspective, and make your border look longer than it really is.

In front of your delphinium a clump of Madonna lillies looks extremely well, also *Campanula Persicifolia Alba*, or *Moerheimi* (double white) or *Coreopsis Lanceolata*, or any other yellow flower which blooms at the same time.

Fortunately, the delphinium is easy to grow. It requires rich soil, and your border, trenched as advised before, is ideal. It requires a generous diet, and no plant will repay you better for good cultivation. The autumn seems the best time to plant out, for the roots become established in the fall, and you will have stronger plants the next year. However, it does very well when planted in early spring.

Plant not less than two and a half feet apart. For winter protection use a loose cover of strawy manure or leaves.

The greatest enemy of the delphinium is the slug, which attacks the crowns in the winter or early spring, scooping them out and thus ruining all prospects for flowers the next year. There is a simple remedy for them, which is to put a layer of about two inches of coal ashes over each plant, working it down well between the stalks with the fingers.

The summer treatment for these plants is to give a copious supply of water in dry weather. Very few amateurs, beginners anyway, know how to water the garden correctly. To wet the surface only is worse than useless, for it encourages the rootlets to come to the top and the hot sun burns them. When you use the hose, use it thoroughly, if you only do a small portion each night. Then do not use it again for quite a few days, but stir up the ground and make a fine dust mulch, which prevents evaporation. These waterings can be supplemented by an occasional dose of weak liquid manure. By doing this, up to the time of blooming, and by cutting out all weaker stalks, you will have longer stalks, larger flowers, and more brilliant colors.

There is one thing you will have to prepare for, and that is staking, or the first big rain and wind storm will flatten out your stalks, to rise no more. There are different ways of doing this. I use five or six-foot lengths of stakes, painted green, and arrange three to a plant. Then I use galvanized wire tied with raffia, and as the plant grows I add a wire. This method encourages the plant to grow in a natural manner, and while the stalks do not look very nice at first, they are soon hidden.

Delphiniums are dwarf, medium and tall, single, semi-double, and double, and the colors are all shades of blue, but there are also of late years white and cream color. Of the new varieties, the individual flowers are up to three inches in diameter. The price of the named varieties is from twenty-five cents to three dollars each. The ordinary varieties are not worth growing, and it will pay you to get a few choice named varieties, among which are: Persimmon, Lamartine, Bella-donna, Capri (low growing), La France, Lizzie, Duke of Connaught, Carmen, Perfection, Amos Perry, Jubilee, Queen Wilhimina, La Danube, Rev. E. Lascalles, Willie O'Brien, Alake, Rev. E. Augustus Bowles, Statuaire Rude (\$2.00), Moerheimi (white), Beauty of Langport (cream), King of Delphiniums.

You are no doubt aware that these flowers bloom in July for about three weeks. If you cut down the stalks to within a few inches of the ground as soon as the flowers fade, and work in a handful of bone-meal around each plant, water sufficiently and supplement with weak liquid manure, you will have another crop of bloom in the fall, which may not be as tall as the first, but will be welcome nevertheless.



DELPHINIUM BELLADONNA.

DELPHINIUM FROM SEED.

If you buy a package of the best *double* seeds from a reliable seed man (I get mine from Amos Perry, Enfield, Middlesex, England, at 2s. 6d. per packet) and start them in flats in the house in February, or in a hot bed in March, you will have plants big enough to set out in June, and they will flower in the fall of the same year. Out of a package of such seeds, if they are good ones, you will get quite a few choice plants, and perhaps some remarkably fine ones. If you have some choice named varieties of your own, save some seed and plant it in August in some seed bed in the garden, and you will have seedlings which you will have to put in cold frame to winter over. These will bloom the next July.

To grow seed in a flat is quite simple. A flat is a finnan haddie box about three inches deep, which you can get at the grocers. Put in the bottom about one inch of cinders, broken pots or anything which will do for drainage. Then fill up to within a half-inch from top with good potting soil, consisting of black loam, leaf mould, well

rotted manure, and coarse sand. Press down firmly with a flat piece of board and water thoroughly. After a day or so the soil will be in a nice condition for the seed. I cover these seeds with a quarter of an inch of sand, and placing a piece of brown paper or glass and paper over the flat, it is put in a fairly warm place (65 to 70 degs.) until germination takes place. Delphinium seeds take from two to three weeks to germinate, and in the meantime, see that the soil is nice and moist. Water by putting flat into a tub and allow the water to come up about half an inch from the top of flat, and as soon as you see the surface turning moist, take it out. After the seedlings are up remove the cover and put in a sunny window. Be careful to give fresh air to them now and then, as they have a habit of damping off. When the seedlings get their third leaf, take out of flat and put them in a somewhat deeper box, planting them about three inches apart. These can then be put out into the garden about the 1st of May. I plant them about six inches apart, and when they show bloom I mark the good ones to be transplanted and throw the poor ones away.

Besides the delphinium you can grow in the same way to flower the same year: Pyrethrums, lupines, hollyhocks, and Iceland poppies, and to make nice plants to bloom the following year, you can grow *Aquilegia* (Columbines) and Oriental poppies. These are all choice perennials, but more will be said about these later.

Correspondence

No. 2 Dental Clinic,
Bramshott Camp, February 2, 1917.

Dear Doctor Seccombe:

In the first place I wish to thank you for the ORAL HEALTH that I received the other day. It served as a reminder of my promise to send you an account of our trip. I had not forgotten that promise, but had been waiting to get an idea of the conditions over here before writing, so that I could tell you something of what the Dental Corps are doing in this camp.

We arrived at a time when considerable changes and readjustments were being made in the arrangement and distribution of the troops; and consequent changes are being made in the arrangement of the Dental Corps in this camp, so that I shall not be able to give you a very detailed nor complete account. However, I shall try to tell you something of our trip, and of what conditions we have found here.

The draft, consisting of eight officers and fourteen other ranks from No. 2 Division, entrained at Toronto about 10.15 p.m. on Tuesday, December 12th last. At Kingston we were joined by the draft from that division. We arrived at Montreal about 10 o'clock

next morning and remained there on the train until shortly after noon. On our train were drafts from the C.A.S.C., A.M.C. and 213th Battalion, besides our draft—about forty officers and four hundred men in all. After a slow and rather tedious trip we arrived in Halifax about 6 p.m. on Friday. We entrained at once in the dark and embarked on the *Olympic* in about an hour. There we found the C.A.D.C. officers and men from the other districts already on board. Our total draft was fifty officers and one hundred other ranks—the fifth and largest draft yet sent overseas from our corps. Capt. O'Neill of District No. 10 was in charge.

Next morning the boat left the dock, but shortly afterwards anchor was dropped in the harbor, and there we remained at anchor for five days. We were not allowed to go ashore, and the only interesting sight was the manoeuvring of two small submarines in the harbor. There were about six thousand men aboard our boat, the C.A.D.C. having the largest individual number of officers. About the middle of the afternoon of December 20th the anchor was weighed and our ocean trip to England began. Life belts were served out to all on board, and were worn throughout the voyage. Most of the way we were without a convoy and travelled at nearly full speed. The weather was splendid throughout the trip. The days were all very much the same—breakfast at 7.15 a.m. There was little to be done on board except eating, sleeping, reading and walking the deck; some of the officers spent part of their time in the gymnasium. One officer each day attended to emergency cases among the troops on board. There was a practice alarm every day to get the men accustomed to their places and duties in case of danger. On the afternoon of Christmas day, about three o'clock, we sighted the south coast of Ireland. Soon afterwards we were met by destroyers, which escorted us to Liverpool. We anchored there next morning, but were not able to dock till the 28th because of a heavy fog. However, we disembarked about noon that day, and almost immediately boarded a train for Bramshott. On arriving at Liphook, the nearest station to Bramshott Camp, at eleven p.m., we detrained and marched to camp, a distance of about two miles. There our draft was divided up and quartered with different battalions for a few days. The first night we all slept on the floor, but afterwards more comfortable quarters were found. After a few days Captain Winnett came up from London and directed the distribution of the draft. Eight officers were left here, the remainder going to Shorncliffe, Crowborough, Whitley, Seaford and other camps. Our sergeants and men were quarantined for fifteen days because of an outbreak of disease that had occurred on board among some of the troops.

At present there are twenty-three dental officers in Bramshott Camp, including Major Gibson, the A.D.D.S.; Capt. Greene, lately returned from Havre, France, and Capt. McLean, also

returned from France and transferred to the C.A.D.C. The twenty operators (Capt. Greene and McLean are in the office of the A.D.D.S.) are divided among three clinics. In our hut there are five operators. Each has a chair and an outfit, which, while not as complete as we were accustomed to in Canada, is sufficient to carry on with. The plate work is done in a separate clinic, where they have about fifteen sergeants working under the supervision of an officer. Most of the officers are attached to the C.A.S.C. for quarters and rations, but some of us are attached to battalions.

This camp is being made into a camp of reserve battalions, each consisting of about two thousand men. I understand that there is a movement on foot to attach two dental officers to each reserve battalion and have them quartered with their respective battalions.

There is a difference between the work here and in Canada. Every soldier, before he can proceed to France, must be dentally as well as medically fit. That means that he is to be in a condition where his masticating apparatus will serve him in comfort and efficiency for a year. To that end, stumps which are in a healthy condition are not removed; the treatments are not so numerous; and amalgam, and more particularly cements, are the filling materials used. Every new battalion coming in undergoes a dental inspection; and the men are divided into two classes, fit and unfit. The unfits are then made fit as soon as possible. There is a great deal of work to be done, and we have no running water, nor electric engines; but we are becoming accustomed to conditions here and hope to do our share for the good cause.

I am afraid that this has been a rather rambling and disconnected letter, but I know you are interested in the C.A.D.C., and hope, for that reason, that it will not prove altogether uninteresting.

Yours very sincerely,

HAROLD CAMPBELL.

Ontario Oral Hygiene Committee

THE executive committee of the Oral Hygiene Committee of the Ontario Dental Society held its 57th meeting on Thursday, January 18, 1917, at the Crescent Inn, 473 Spadina Ave., at 6.15 p.m.

Members present were Doctors Reade, McLaughlin, Ellis and Coyne.

The minutes of the last meeting were read and confirmed.

The secretary read correspondence from Dr. Ayres, of Prince Edward Island, regarding the purchase of slides for lectures.

Dr. McLaughlin read a letter from the Ontario Safety League asking the Oral Hygiene Committee to prepare industrial and school bulletins regarding teeth and health.

The chairman reported having received from the secretary of the Canadian Oral Prophylactic Association an inquiry from Dr. Mabée, of Gananoque, regarding slides for lectures. The secretary was requested to reply to Dr. Mabée.

Some months ago the committee saw the necessity of preparing a lecture form for the use of lecturers on oral hygiene work, and appointed a committee to draft a form. Stress of work has prevented the preparation of this form.

It was moved by Dr. McLaughlin and seconded by Dr. Reade that the secretary communicate with Dr. Seccombe regarding this matter and ask him to prepare the outline as soon as possible. Carried.

Moved by Dr. McLaughlin and seconded by Dr. Ellis that the secretary write Dr. Ayres, of Prince Edward Island, advising him that the Oral Hygiene Committee can furnish him with a set of charts for \$3.50. Carried.

Moved by Dr. McLaughlin and seconded by the secretary that Dr. Ellis and Dr. Seccombe be appointed a committee to prepare the bulletins for the Ontario Safety League. Carried.

The secretary was instructed to write the Ontario Safety League advising them that the bulletins were being prepared as they had requested.

Moved by Dr. McLaughlin and seconded by Dr. Ellis and carried that the following accounts be paid: Board of Trade luncheon (39 present), \$21.50; Walker House dinner (58 present), \$61.50; express and cartage on charts to Dr. Fuller, London, and Dr. Little, Owen Sound, \$1.00; Rawlinson, cartage on charts from chairman's office to secretary's office, \$1.20.

It was moved by Dr. Reade and seconded by Dr. McLaughlin that Dr. Ellis work out a plan whereby a dental inspection might be made of the teeth of the children over a certain area in Ontario, for example, two counties, in order to obtain statistics to present to the Government when advising compulsory dental inspection throughout the province, and that Dr. Ellis report at the earliest possible date. Carried.

The chairman and secretary were appointed a committee to draft a letter to the members of the sub-committees of the Oral Hygiene Committee asking them their wishes on the proposal to transfer dental inspection from the control of the Department of Education to the Provincial Board of Health.

The committee appointed to select a lecturer to address the Trustees' and Inspectors' Section of the Ontario Educational Association next April reported that Dr. Wallace Seccombe was chosen to prepare a paper.

ROBERT J. READE,

Chairman.

N. S. COYNE,

Secretary.

ACTIVE SERVICE ROLL

Complimentary copies of ORAL HEALTH will be sent during the progress of the war to all Dental Graduates on active service whose army address is known.

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CAPT. J. R. DUFF, 79th Batt.

LIEUT. H. J. MACLAURIN, 43rd Batt.
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†Director of Dental Services, address Folkestone. ‡Director of Dental Services, address Ottawa. *Lieutenants rank as Captains while overseas. C.A.D.C. overseas address—care of Director Dental Services, Canadian Contingents, 23 Earls Ave., Folkestone, England.

of CANADIAN DENTISTS

ORAL HEALTH will appreciate receiving names and addresses or other information that will make these pages a complete Army Service Directory constantly available to every member of the profession.

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THE COMPENDIUM

This Department is Edited by
THOMAS COWLING, D.D.S., Toronto

A SYNOPSIS OF CURRENT LITERATURE RELATING
TO THE SCIENCE AND PRACTICE OF DENTISTRY

PRESSURE ANESTHESIA.

MANY methods of dental treatment that are calculated to give excellent results, if used properly, oftentimes fall far short of our expectations because we use them indiscriminately. An operator should draw, in a large measure, upon his judgment and experience before selecting the method of procedure in unusual cases. As illustrative of this, let us consider briefly the method known as pressure anesthesia. All of us have learned to appreciate the benefits of this method. Many, perhaps, have at one time or another been tempted to discount its value because of occasional misadventures. Perchance we have used pressure anesthesia in cases where its use was contra-indicated and with unsatisfactory results. But why blame the method when we ourselves are solely at fault?

Discussing this question, the *Pacific Dental Gazette* says: "It is of extreme importance to bear clearly in mind the indisputable fact that pulp exposure invariably spells pulp infection, and that unless the exposure is of very recent occurrence, the painless removal of the pulp must be accomplished by methods other than cocain—pressure anesthesia."

The number of cases suitable for pressure anesthesia is very limited, including as it does, only those conditions where there is a "fresh" exposure of the pulp, or where for prosthetic or other reasons a healthy pulp has to be sacrificed. In cases coming under this last heading it is necessary to gain access to or make a "fresh" exposure of the pulp before applying the cocaine. If pressure anesthesia is used to extract an infected pulp, then the infectious material may be forced beyond the apex and give rise to serious complications.

Rather than incur risks in doubtful cases, it would be better to resort to other means of devitalization, such as intra-osseous, infiltration and conductive methods of inducing anesthesia, or even the application of arsenic.

Now that such stress is being placed upon the question of dental treatment as related to chronic foci of infection, it would be well for us as dentists to use only the most approved methods in our practice

and not run the risk of causing apical trouble through our adoption of short-cut methods in operating.

SYPHILIS AND RICKETS—SOME OBSERVATIONS.

If for no other reason than a desire to get away from the purely mechanical in dentistry we ought to take greater interest in the diagnosis of any unusual conditions to be noted in the patients we meet from day to day. We ought to be capable of weaving the life history of say, an imperfect dentition or other notable physical defects. Further, we ought to be in a position to make an accurate forecast of the outcome of these ailments, whether they be of a hereditary, congenital or acquired type. In a sense such a study belongs to that new and perhaps most important department of dentistry, viz.: "Preventive Dentistry," because through it we shall be enabled to select the methods of treatment that are most suited for the preservation of the teeth of those who are suffering from grave disabilities.

The observant dentist will no longer be content in classifying the teeth of rickets as "soft teeth" or the ill-formed syphilitic dentition as "faulty enamel," but will treat these as special cases and will adopt remedial measures in accordance with the particular requirements. The first step in this direction is a correct diagnosis; skill in detecting symptoms is imperative. It is essential also that we know the causative factors as well as the best curative means. Syphilis and rickets show very marked characteristics, and these should be carefully studied. The mal-formations, due to syphilis, are familiar to most, but those due to rickets have not been referred to very often in dental literature. It will be interesting therefore to review the account of the early progress of this disease as given by J. Lawson Dick, M.D., in January issue of the *British Journal of Dental Science*. He says: "The lymphatic system is at its highest development during infancy, the period of growth takes place apparently out of proportion to the amount of food taken in. In rickets the lymphatic system is developed to excess. The spleen is enlarged. The lymphatic glands, including those of the mesentery, are apt to be enlarged and hard. On section they are white and opaque. The tonsils are frequently enlarged and adenoids are apt to develop. Often these children suggest the possibility of lymphatism or status lymphaticus, and sudden death during the operation for extirpation of tonsils and adenoids is not unknown. In rickets there is a probability that the child is acted on adversely through the mother's milk owing to the absence or deficiency of some active principle normally present. But the poor quality of the milk alone does not cause rickets, nor does the absence of any particular constituent in the child's diet produce it. The intake and assimilation of food are good up to a certain point, but its utilization for the building up of the body is far from satis-

factory." As regards the causative factors in rickets, Dr. Dick suggests that slum conditions of living are the most potent. Absence of light, want of ventilation, overcrowding, lack of sufficient exercise will tend to produce rickets. A food diet that is deficient in nitrogenous elements also contributes to this condition.

In support of his slum theory, the author points out that rickets are not common in those countries where outdoor life is common. In Canada and Australia this disease is uncommon, but tends to increase in proportion as the cities grow in size and density of population. Going particularly into the question of overcrowding and its effects upon body growth, Dr. Dick states: "Overcrowding produces its effects through the glands of internal secretion. The thyroid, as evidenced by extreme vascularity and the ease with which it swells when any demand is made upon its activities, requires the free circulation of properly oxygenated blood. In the absence of these conditions its functions are inadequately performed. On the other hand, the thymus is a sluggish gland which seems to thrive in these conditions. In the absence of the proper stimulus from the thyroid, the great controlling internal secretory gland of the body, the proper balance between the two glands is lost."

Among other symptoms of rickets, even in a mild form, may be included the arrested or late dentition, a large fontanelle, a slight enlargement of the wrists and ankles, and a slight beading of the ribs.

Fresh air, exercise, etc., combined with a suitable diet, will do much as a prophylactic measure. In England, it is said, that of all the children of school age, 80 per cent. are defective. This points to the necessity for medical and dental treatment early on in the children's life if good results are to be obtained.

As a preventive measure, the expectant mothers and mothers with babies, receive especial attention. Care is given backward children in the schools and they are provided with playgrounds and made to attend open air classes. At the present time there is a movement towards supplying poor children attending schools with pure milk free of charge.

SYPHILIS.

The dentist is apt to centre his interest on one tooth or on a number of teeth and fail to make even a hurried examination of the mouth cavity. Herein he is at fault and may even be jeopardizing his own safety; this is the contention of A. H. H. MacMorran, M.D., M.S., Ed., Capt. A.A.M.C., whose paper is published in the December issue of the *Commonwealth Dental Review*. Herein the author cautions dentists of their danger, which he thinks is a very grave one, "because bacteriologically, the mouth is the cavity in the human body which is the most unclean, and therefore the operating dentist runs

very considerable risks in the course of his daily avocation, and from none more than the danger of infection with syphilis."

Secondary syphilis may be diagnosed by the presence of mucous patches, which appear soon after the appearance of the primary sore or hard chancre. They are "white shiny patches, often behind the tonsils and often spreading over the back of the fauces and soft palate; but the condition to be aware of is the smaller patch which appears on the gums, inside of lips or cheeks, and on the tongue. These patches are distinguishable from diphtheria by the absence of other symptoms, such as fever, rapid pulse, headaches, etc., and from apthous patches which occur only in the very young or aged or in debilitating diseases, such as phthisis in advanced stages. Not infrequently mucous patches occur *pari passu* with a distinctive rash over the abdomen and other parts of the body, and more rarely on the face in the form of unsightly blotches and furuncles, and in their turn distinguishable from acne by the deep copper color of the spots."

We are reminded that the tertiary stage is represented by the gumma, which is not so infectious, and is found in the centre of the tongue as a firm, raised, whitish mass, extending almost through the thickness of the tongue. This is distinguished from epithelioma by its size and position, the latter being almost always at the edge of the tongue, and is much smaller.

Evidences of congenital infection may be found by examining the teeth. Should a child that is syphilitic when born, recover under treatment, "the teeth of the first dentition will show no sign of the disease except that there is a tendency to early decay, which may commence almost immediately after eruption, but this is by no means symptomatic of syphilis only. It is not until the second dentition that the inherited trouble becomes manifest; the condition is then unmistakable; the incisors are late in appearing; they are peg-shaped and notched in the centre of the biting edge, which is deficient in enamel, the dentine being exposed; decay up the centre of the tooth is rapid; the teeth are erupted irregularly and are far apart and immature, the roots are often twisted and appear through the alveolus at an angle; then the alveolar margin becomes decayed, the gums recede and discharge, and soon the whole mouth becomes ulcerated and foul with a peculiar phosphorous odor; such cases do not yield readily to treatment, and in any case the teeth never recover; they are troublesome to extract as they crumble readily, and are a source of danger to the operator.

PRURITUS IN ORAL SEPSIS.

Evidence in favor of mouth cleanliness is rapidly accumulating. Almost daily we hear of old and baffling ailments yielding to skilful dental surgery. We hesitate to add more testimony to that already accumulated lest its reading become wearisome, yet here is a case that deserves mention because of its uniqueness. It is a report of a case

presented by Dr. W. G. Smith (see the *British Journal of Dental Science*, Jan., 1917). He says: "Shortly before Christmas of 1915, I was consulted by a gentleman whose sole complaint was of an itching of the skin. The itching would occur on any part of the body, but was generally worst on the flexor surfaces of the upper and lower extremities and across the chest. It might occur any time during the day, but was invariably worse when undressing at night and after getting into bed. He was a commercial traveller by occupation, and while his home was in one of our larger cities, his territory lay within Northern Ontario. He could scarcely sleep at night, and in almost every place where he would stop overnight he would have to go to a local physician to try and obtain something to enable him to sleep. He had followed out various lines of treatment without improvement. He called at my office one evening on his usual errand to get something to make him sleep. The most careful examination of the skin did not disclose any lesions excepting those produced by scratching; he was most particular about his person and his clothes; did not use liquor or drugs, but did use tobacco moderately. The urine did not show sugar or albumen." Dr. Smith says he then examined the mouth and found a most septic condition. He was sent to a dentist for treatment, and soon his condition, which must have been caused by an altered condition of the blood, due to the absorption of septic material, cleared up and he was able to enjoy natural refreshing sleep.

Used Teeth and Compound Required for Overseas Sergeants' Class, R.C.D.S.

PRACTITIONERS, having accumulations of discarded dentures, odd teeth, used Kerr's compound, will be doing a real service to the seventy young men, now busily engaged as members of the Special Overseas Sergeants' Class preparing for this duty in the Canadian Army Dental Corps, by sending them to the Royal College of Dental Surgeons, 240 College St., Toronto, c-o Department of Prosthetics.

In many instances, the sacrifice of these young men is considerable, and a general response to the above appeal will materially assist these men, by eliminating at least one item of their expense account.

REPAIRING PLASTER CASTS.—Celluloid is dissolved in equal parts of camphor and ether, enough to make a creamy mixture. The parts of the cast are perfectly dried, painted with this solution, firmly united, and allowed to dry. This celluloid mixture is insoluble in water, and does not suffer by vulcanization.—*La Odontologia Peruana*.

MULTUM IN PARVO

This Department is Edited by
C. A. KENNEDY, D.D.S., 2 College Street, Toronto

HELPFUL PRACTICAL SUGGESTIONS FOR PUBLICATION, SENT IN BY MEMBERS OF THE PROFESSION, WILL BE APPRECIATED BY THIS DEPARTMENT

TO PREVENT THUMB-SUCKING IN CHILDREN.—Dr. George H. Henderson calls attention to a very ingenious method of preventing thumb-sucking, suggested to him by Dr. Truman W. Brophy. Make a pasteboard cuff to the right size and length to slip on the arm, small enough not to slip off the hand. Sew cotton or other material on the edge to prevent it from irritating the hand. It can be bound with adhesive tape or straps and buckles. This will prevent any use of the elbow, and it is much more human than the use of bitter drugs and other such expedients.—*Dental Review (Dental Summary)*.

DIET IN PYORRHOEA.—Those under treatment for incipient or chronic interstitial gingivitis (unless contraindicated by some organic disease) should eat freely of fresh vegetables every day, particularly succulent uncooked ones; all the fresh fruit they can when it is in season, and unless engaged in hard manual labor or taking violent exercise, very little meat. Sufficient protein to meet the body requirement of the average man may be obtained from eggs, milk and milk products.—*John S. Engs, Dental Items of Interest (Dental Summary)*.

CARE OF HANDS IN LABORATORY.—Before opening vulcanizer, or working in plaster, or with flasks, if you will wash your hands in soft water with good soap, and while still moist, pour on or rub in olive oil, you will find when you are ready to cleanse the hands that the stains have not penetrated the skin.—*J. M. H., Dental Review (Dental Summary)*.

ABRASIVE MIXTURES USED IN CLEANING TEETH.—To a teaspoonful of pumice add ten drops of aromatic sulphuric acid for the removal of tobacco stains.—*Practical Oral Hygiene, Adair (Dental Summary)*.

TO RELIEVE PAIN OF HYPODERMIC NEEDLE.—Ethyl chlorid, on a pledget of cotton wool, applied to the gum (well away from tooth) previous to inserting the needle for injection, will be found to lessen the pain very considerably. I find this method very helpful in dealing with small children.—*W. A. Love, Commonwealth Dental Review (Dental Summary)*.

STERILIZING CANAL POINTS.—Fine canal points placed on a cement slab and sprayed with sulphuric ether with an ordinary atomizer will be sterilized and stiffened.—*F. A. W. (Dental Review)*.

TO PREVENT 95% OF PHENOL FROM CRYSTALIZING.—Instead of warming the phenol add a few drops of denatured alcohol and you will find that it will remain solvent, no matter what the temperature of the room may register.—*Wm. V. Sher, Chicago (Dental Review)*.

HYPERSENSITIVE DENTIN.—A concentrated solution of sodium bicarbonate in glycerin is recommended in the treatment of sensitive dentin. It is stated that it embodies no disadvantage in so far as discoloration or effects on the pulp are concerned, and on the other hand, it proves, in a large majority of cases, as efficient a means of obtunding sensitive dentin as any at present available.—*La Odontologia Colombiana, per Pacific Dental Gazette (Dental Cosmos)*.

ANCHOR TO ONE TOOTH ONLY.—In getting away from the gold crown anchorages for bridges many failures have resulted with inlays used for the same purpose. A large percentage of these failures can be entirely overcome by a radical change in the methods of making the bridge. In all cases where but a single incisor cuspid or bicuspid is missing, anchor the porcelain tooth to but one tooth instead of one on each side. Strange as it may seem, half anchorage like this will hold far better than the usual double attachment. The reason is very simple—the dummy tooth moves slightly, as all teeth do, with the one tooth to which it is attached, and has no tendency to break away from the opposite side.—*Arthur G. Smith, Peoria, Ill. (Dental Review)*.

RESTORING THE CONTACT.—When you are called upon to insert an inlay or filling in a case when the contacts have been loosened you should wedge the teeth till you tighten the contacts on either side, and then you should make the mesio-distal width of the inlay a little bit greater than would seem necessary to make a tight contact, and force that inlay in every case until the patient complains. When you drive the inlay to place, the patient will say: "That is too tight, doctor; I can't stand that." But you can assure them that it will not be uncomfortable any appreciable length of time. In doing that you not only secure a good contact in the tooth you are operating on, but tighten the contact of the other teeth on that side. I look upon the tightening of the contact all along the arch as one of the important things.—*C. N. Johnson, Western Dental Journal (Dental Summary)*.

PREPARING CAVITIES.—In the preparation of cavities, if the bur be continually dipped into a vessel containing ethyl chlorid, the pain caused by drilling will be considerably diminished.—*William A. Love, Commonwealth Dental Review (Dental Summary)*.

HEATING OF SILICATE CEMENT FILLINGS CONTRA-INDICATED.—Application of heat to a silicate filling in order to save time was discarded years ago as a pernicious practice, because it resulted in unequal setting of the filling, and caused opacity, leaky and imperfect margins due to contraction, decreased strength and resistance to the oral fluids, thermal shock, and in all, lessened durability. Revival of this practice is to be deplored, because its ultimate effect will be dissatisfaction with the silicates when, as a matter of fact, the "hurried job" is responsible. Experience suggests the best practice, that is, to let the filling set normally, under natural conditions, since this promotes durability, and thus better serves the interest of the patient.—*Dental Quarterly (Dental Cosmos)*.

SOFTENING DRIED MOLDINE.—The hard and dried out moldine is broken into small pieces, which are placed in water, to which a half-teaspoonful of glycerin has been added. The mass is left to stand in a warm place until the water is evaporated. Kneading will render it fit for use again.—*Northwest Journ. of Dentistry (Dental Cosmos)*.

TUNGSTEN AND MOLYBDENUM AS A SUBSTITUTE FOR PLATINUM.—In view of our difficulties in regard to platinum, we append a few notes on these two metals. Tungsten is twice as elastic as steel, and melts at a much higher temperature than platinum, viz., 3,000 degs. C.; it is extremely hard, and can be drawn into a finer wire than any other metal. It is unaffected by ordinary acids or alkalis, but it is said to be soluble in hydrogen dioxid. Molybdenum somewhat resembles tungsten in having a much higher melting point than platinum, viz., 2,500 degs. C., as compared with 1,750 degs. C. for platinum; it differs, however, from tungsten in being devoid of elasticity, and is therefore recommended for certain dental regulating appliances.—*Brit. Dental Journal (Dental Cosmos)*.

PRACTICAL RELATIONSHIP BETWEEN DENTIST AND PHYSICIAN IN REGARD TO DECIDUOUS DENTITION.—The dentist can do much to dispel the erroneous ideas still rampant among the laity, and unfortunately often fostered by physicians, in regard to the diseases caused by teething. The bugaboo of dentition in the second summer disappears in the face of clean, wholesome, refrigerated milk, and a properly regulated diet. The occurrence of certain skin diseases, as eczema, impetigo, herpes, and the erythemata or croup in the teething period is accounted for by conditions which are known and recognized by pediatricians as the "exudative diathesis or the spasmophilic tendency." Here recognition of the underlying condition and its treatment bring amelioration and cure.—*G. R. Pisch, Dental Outlook (Dental Cosmos)*.

ORAL HEALTH

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Vol. VII.

TORONTO, MARCH, 1917

No. 3

EDITORIAL

Independent Journalism Versus Trade Journalism in Dentistry

THE following letter reached the editor's desk a few days ago and raised a question of such importance that its immediate publication was decided upon. There is no man in Canadian dentistry regarded more highly than Harold Clark or in whom Canadian dentists have greater confidence. This fact certainly adds force to the communication, quite aside from the issue raised:

"Temple Building,

"Toronto, 20th February, 1917.

"Dr. Wallace Seccombe,

"Editor ORAL HEALTH.

"My Dear Dr. Seccombe:

"In the December issue of *The Journal of the Allied Dental Societies* there is an article by William J. Gies on the subject of 'Professional Versus Trade Journalism.' I read the article with much interest, and at the same time with considerable surprise.

"The article starts off in an atmosphere of the loftiest ideals and

discusses the characteristics that should differentiate professionalism and business or trade standards. Then it passes on to a consideration of professional versus trade journals, and conjures up a dental journal very suggestive of a journalistic millennium.

"Someone has said that whom you would damn most effectively, him you must first praise. The article then selects the S. S. White Co. and *The Dental Cosmos*, and after heaping fulsome praise on the company and the goods it has to sell, damns the company for the manner in which it controls *The Dental Cosmos*.

"Now, for over twenty-five years I have been a constant reader of *The Dental Cosmos*, and it has always seemed most obvious to me that a very definite understanding must exist between the editor and the owners, that the journal was *his* and the advertising pages *theirs*, and that the business office of the company must not cross the threshold of the editorial rooms.

"As an evidence of an unfailing rule that must dominate the editorial chair of *The Dental Cosmos*, I would like to cite the following fact: Anyone in touch with the dental affairs of America must know the colossal amount of work that Dr. Kirk must have put into the task of making the Evans Dental Institute. It must surely have been a labor of love on his part, and when it was completed it must have been to him his greatest achievement. And yet when it was opened *The Dental Cosmos* made no 'scoop' of the matter. We had to look to other journals to read about it. 'Kirk the editor' wouldn't allow 'Kirk the dean' to take any advantage.

"A company like the S. S. White Co. must keep announcement of their output before the profession, and they are big enough to realize that it is worth their while to spend the money necessary to produce a journal of so high a character that the best of the profession must have it, in order that they may have the opportunity of presenting their business announcements. By doing so they have done a great service to the profession as well as to themselves.

"I have said that Dr. Gies' article held something of surprise for me. I am quite unable to understand the animus that could prompt his article and select *The Dental Cosmos* for the vials of his wrath. You, Mr. Editor, publish a 'non-trade' journal and perhaps see clearly, where things are obscure to me, and I shall be grateful for your estimate of the article.

"Cordially yours,
"HAROLD CLARK."

The article referred to by Dr. Clark covers forty-seven pages of space and is consequently much too voluminous to reproduce in this journal. The author objects to dental magazines being published by dental manufacturers. Such a subject may be decently discussed without singling out from the whole group just one manufacturer, one magazine and one editor, and referring to them in such an objection-

able and personal way as to defeat the whole purpose of the article. The reader, though naturally sympathetic, is left with nothing but a brown taste. The wonder is that much of the manuscript ever escaped the official blue pencil.

During the past decade *The Dental Cosmos* has undoubtedly attained a place pre-eminent among the dental journals of the world, and has consistently stood for high ideals and lofty attainments in the science and practise of dentistry. And yet, according to W. J. Gies, of the Department of Biochemistry of Columbia University, *The Dental Cosmos*, its editor, and its publishers are in some insidious way conspiring, consciously or unconsciously, to destroy the very spirit of independence for which we dentists have always understood *The Dental Cosmos* to stand. Surely Professor Gies has not arrived at his conclusions by a dispassionate study of the facts; rather, we should say, by some remarkable feat of alchemy. In this particular journalistic venture of his, however, there has occurred a rather unfortunate perversion. In place of alchemic conversion of base metal into gold there has developed a process whereby a transmutation of much that is valuable and worthy, would be consigned to everlasting oblivion.

Professor Gies is decidedly in favor of dental journals being published by Dental Societies. Very good. The plan is ideal, provided *no advertisements* are carried. The practicability of its general application is quite another matter. If advertisements are accepted, there is raised immediately, no matter who the publisher, the question of editorial and business ethics. It is the judgment of the writer that it is quite possible for an editor and business manager, though appointed by a Dental Society, to conduct a dental journal in a most unethical way. Upon the other hand we believe it equally possible for an editor, employed by a dental manufacturer, to conduct the reading pages of the journal according to the highest standard of professional ethics. In the final analysis it depends largely upon the editor—upon the man.

The Journal of the Allied Dental Societies is a most excellent journal, published by New York and Massachusetts Dental Societies, and has always claimed to examine every advertiser with a microscope before admitting him. The amusing thing is that in the issue in which Professor Gies, in the reading pages, hammers the S. S. White Company for certain statements in connection with an advertising campaign recently launched, the same "copy" appears upon two of the advertising pages of the identical issue, and this space was doubtless sold to the said S. S. White Company at so much per. Under the said advertisement there appear the words, "When writing to advertisers please mention *The Journal*," which certainly gives the impression that *The Journal of the Allied Dental Societies* is in sympathy with the advertising "copy."

Under such circumstances in what vital essential does *The Journal of the Allied Dental Societies* differ from *The Dental Cosmos*?

Thus we follow the Scotchman's plan of answering one question by asking another. Thank you, Dr. Clark, for your letter. Write again.

Need for Travelling Dental Surgery at the Front

Headquarters, Director of Dental Services, C.E.F.,
Room 309, Argyll House, Regent St. W., Feb. 2, 1917.

To Dr. W. Seccombe,
269 College St., Toronto, Ont.

MAY I take this privilege of thanking you for forwarding ORAL HEALTH to me from time to time. I have read over the different articles in your magazine with great pleasure and interest, especially the article in December number on travelling dental surgery used in the French army. This outfit would be a great boon to our officers attached to field ambulances and other mobile units. It would obviously do away with unnecessary crowding of transports for medical units, apart from the advantages of having a dental outfit in such comfortable quarters. Not only would the dental surgeon appreciate the commodious quarters and conveniences to their full, but the individual soldier undergoing treatment would be greatly benefited. Very often it has been my lot when at the front to have been placed in quarters which were by no means suitable for dental surgery. This was the case at Albert on the Somme front. The only available spot to work in was in the engine room of a machine shop. One afternoon Fritz apparently had some idea there were troops in the vicinity and turned his big guns on us and made it rather uncomfortable by his accurate shooting. Unfortunately, three men were knocked over just outside the door of the building in which we were working, and two of the men succumbed to their wounds. If we had had a travelling surgery, such as described in the article referred to, we could have immediately moved out of the dangerous area. Not only would it be of great advantage in this respect, but it could so easily be moved from place to place as to enable us to keep in close touch with the men who, needless to say, require a great amount of dental attention.

Speaking of my own connection with the Dental Corps here, I may add that I was recalled from France in December last to be Adjutant of the C.A.D.C. in England, and have since been stationed in London with Col. Armstrong, Director of Dental Services, at our headquarters, Argyll House, Regent St. W.

Anything that can be done to advance dentistry, either in the

transmission of articles on dental matters by our officers, or in any other way, will be gladly attended to by this office.

A. W. WINNETT, Capt. and Adjt.,
Canadian Army Dental Corps, C.E.F.

Back Numbers of Oral Health Wanted

THE following letter from Dr. Dow is self-explanatory. Subscribers who are willing to supply these back numbers, or any of them, will kindly write Dr. Dow direct. If you can assist in this matter your prompt attention will be much appreciated:

"Stanton, Mich., Jan. 23, 1917.

"The Publishers ORAL HEALTH,
"Toronto, Canada.

"Sirs,—I am enclosing check, \$1.00, to pay my subscription to your journal for 1917. In gathering the numbers together for binding I found that the February number of 1916 was missing from my file. Can you supply it?

"My file also lacks the following numbers of your journal. Can you supply any of them? If so, at what price?

"Vol. 1.—I lack all the numbers.

"Vol. 2.—I lack all the numbers.

"Vol. 3.—I lack Nos. 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11.

"Vol. 4.—I lack Nos. 1, 2, 3, 5, 6, 7, 8, 9, 10, 11, 12.

"Vol. 5.—I lack Nos. 6, 7, 8, 9, 10, 11, 12.

"I am trying to collect a dental library, and would like to get in touch with any person or organization you may know of that is interested in the same pursuit. Any courtesy you may be able to show me will be deeply appreciated.

"Sincerely yours,

"THOMAS D. DOW."

Ohio State Dental Society

AT the recent meeting of the Ohio State Dental Society in the city of Dayton the Board of Directors voted an appropriation of \$1,000.00 to the Oral Hygiene Committee, \$200.00 to the Black Memorial Fund, and \$250.00 for additional equipment for the Research Bureau. It was decided to hold the next meeting of the society in the city of Cleveland.

On Good Terms With Himself

“**A** MAN ought to be able to live on good terms with himself. For he lives with himself a great deal more than he lives with anyone else.

“While a man should not always be on the point of moving a complimentary resolution to himself, yet he should be able to bring himself into such harmony, that the ‘business of life’ may be carried on, on a ‘peace footing.’

“The thing which one’s best self commends must not be too far ahead of the thing which one’s worse self allows.”



COL. W. E. THOMPSON
Commandant, Aldershot Camp,
1916.



MAJ.-GEN. E. W. WILSON
Commandant, Valcartier Camp,
1916.

ORAL HEALTH

A JOURNAL THAT STANDS FOR THE "OUNCE OF PREVENTION," AS WELL AS THE "POUND OF CURE"

VOL. 7

TORONTO, APRIL 1917

No. 4

Medical Aspects of Dental Infections, and Their Relation to Dentistry*

H. K. DETWEILER, M.B., TORONTO.

THE history of dentistry, with which you are all more or less familiar, furnishes one of the most interesting examples of the onward march of science. As a distinct vocation it is first alluded to by Herodotus (500 B.C.). The impetus given to medical study in Grecian schools by the followers of Aesculapius, and especially Hippocrates (500 to 400 B.C.) developed among the practitioners of medicine and surgery considerable knowledge of dentistry. From then until now its history has been in the making. In 1728 Fanchard, who has been called the father of modern dentistry, published his celebrated *Le Chirurgien Dentiste ou Traite des Dents*, and from that time on the profession really took on some dignity. Until well into the 19th century, however, apprenticeship afforded the only means of acquiring a knowledge of dentistry, when in 1840 the first dental college in the world was established.

I mention these things merely to show what a vast change has taken place in your profession, and to introduce what I have to say regarding the medical aspect of mouth infections and their relation to dentistry in the light of modern science.

A large part of your work is necessarily purely mechanical, and it is that very fact which becomes a danger, for the time has come when the crown, the bridge and the denture no longer constitute the most important field of practice. You are finding in the various infections about the teeth the field above all others which calls for the highest type of scientific training and skilful execution.

*Read before the Royal Dental Society, Toronto, December 18, 1916.

I became particularly interested in mouth and throat infections a couple of years ago. We were then studying certain medical conditions, particularly Endocarditis. We found in the blood of many patients suffering from even a mild form of this disease a peculiar organism belonging to the family of Streptococci. Time and space do not permit me to go minutely into the classification Streptococci. It is sufficient to say that this particular strain is called *streptococcus viridans* because it has the faculty of producing a green color when grown on blood agar. This organism is pathogenic, that is to say, it can produce disease. It is, however, of very low virulence, and consequently does not produce disease as easily as, for example, the *pneumococcus* or the *streptococcus hemolyticus*, which are highly virulent. The *streptococcus viridans* may be injected into animals without producing very much effect, unless large doses are used.

The following experiments are cited to indicate the pathogenicity and selective action of these organisms. The term V.B.C. means vaccine-bottle-culture. A vaccine bottle of the size we use holds 30-40 cc. of broth. These are inoculated and grown for twenty-four hours. At the end of that time the bottles are centrifuged at high speed, and the supernatant fluid is pipetted off, leaving the organisms sedimented at the bottom. They are then suspended in physiologic saline, and after carefully breaking up the clumps, the resulting emulsion is injected into the marginal ear-vein of the rabbit. From here it is carried directly to the heart and subsequently pumped to all parts of the body. (See Table I.)

The question now arose as to the source of these organisms. Do they actually multiply in the blood stream itself, or are they being constantly fed into the blood from local foci? An authoritative answer to this vexed question has not yet been given, but the preponderance of evidence is in favor of the latter hypothesis. Of these focal points there are three which immediately become of especial importance, namely, the heart valves, the tonsils and the teeth. Many of the cases investigated gave a direct history of recurring tonsilitis. Pure cultures of *streptococcus viridans*, isolated from the crypts of these tonsils, were found to produce endocarditis in rabbits in the same way as described in the previous experiments.

Then a study was made of cases which showed no evidence of trouble in the tonsils, but in which the X-Ray showed abscess formation at the roots of teeth. Organisms recovered from these sources, as well as from the cases of pyorrhoea alveolaris, proved nearly always to be pure cultures of *streptococcus viridans*. On animal experimentation it was found that these cultures produced exactly the same result in the rabbits as the foregoing.

The situation in regard to the normal mouth was then investigated. Pure cultures of *streptococcus viridans* from normal teeth and throats of students were isolated and prepared in the regular way. In all,

TABLE I.—ACTION OF STRAINS ON RABBITS.

No. of Rabbit	Strain of Organism	No. and Amount of Intravenous Injection	Clinical Picture	Death After First Inoculation	Post-mortem Findings.	Post-mortem Cultures
R. 518	Stein ...	2 medium 1 V. B.C.	.....	18 days	Liver, spleen and kidney congested...	Cultures from liver, spleen and heart's blood pure streptococci
R. 517	Stein ...	3 medium doses	Died 15 min. after last injection	11 days	Heart: Subendothelial hemorrhage in muscle wall and also hemorrhage in one of the papillary muscles of the tricuspid valve; hemorrhage into the mitral valve with a very fine vegetation along the free margin; heart muscle shows fatty degeneration; scattered throughout are bacterial emboli, some vessels occluded by bacterial emboli or thrombus of bacteria and corpuseles; nodule of round cell infiltration in mitral valve	Cultures from liver, spleen and heart's blood gave streptococci
R. 521	15-99 ...	3 medium doses	7 days after last injection, rabbit killed, as it was getting very thin	18 days	Heart: Small hemorrhage, brownish, in one of the papillary muscles of mitral valve	Cultures from liver, spleen and heart's blood gave streptococci

TABLE II.—ACTION OF STRAINS FROM NORMAL MOUTHS ON RABBITS.

R. 564	♂; from a normal throat	1 injections of 6 V.B.C.	Temp. after first dose rose to 105.6 F.	16 days	Heart: Heart muscle pale; tricuspid valve shows large vegetation involving the whole valve curtain and forming adhesions with the cusp on the opposite side which is hemorrhagic and edematous; aortic valve almost completely stenosed with vegetations on valve cusps; mitral valve has a couple of small vegetations on the free margin	Cultures of the heart's blood and liver yield Streptococcus viridans
R. 562	♀; from a normal throat	2 injections of 1½ V.B.C.	Temp. after first dose rose to 101.2 F.	3 days; died a few minutes after last dose	Heart: Two small white vegetations on the tricuspid valve close to the free margin; also hemorrhage into one of the valve curtains about 3 by 0.5 mm.; large number of atheromatous patches in the aorta	No cultures taken, as the animal died so soon after the last injection.

eleven strains were used, and with these thirty rabbits were injected. The results were astounding. It was found that these organisms, living ordinarily in perfectly healthy individuals, were also capable of producing disease. Following are some typical protocols illustrating these experiments. (See Table II.)

To make a long story short, we finally concluded that the *streptococcus viridans* from the blood, from the crypts of chronically inflamed tonsils, from alveolar abscesses and pyorrhoeal pockets are all similar, both in pathogenesis and in virulence. We further concluded that the streptococci living in the normal mouth are also pathogenic and are very closely related to those found in the foci just mentioned. We believe that the organisms living in the mouth are harmless in a perfectly healthy individual; but if the resisting power of the patient is below par, and they have the opportunity to get through to the bloodstream, by way of focal points of infection, they have the power to produce lesions which may, more or less, speedily bring about a fatal issue.

The significance of this point is that the presence of these organisms is a constant menace to health. An intelligent comprehension of that fact need not alarm us; rather should we regard this knowledge as the strongest reason for strict adherence to oral hygiene. It shows the tremendous importance of preventive medicine and dentistry.

There is at present a great deal of discussion among bacteriologists as to power of streptococci to choose certain areas of the body in which to localize. One school holds that strains of streptococci isolated from the appendix, for example, will produce appendicitis to the practical exclusion of all other lesions. A strain from the endocardium will produce endocarditis, etc. The other school deny this special localizing power, and claim that the only selective action they exhibit is that which is possessed by streptococci as a family, just as *B. Typhosus*, as a family, has its affinity for lymphoid tissue.

In our laboratory much work has been done on this problem, and as yet no definite conclusion has been reached. Conflicting results are often met with, but certainly many experiments seem to favor the view that streptococci do have an elective localizing power. For example: A *streptococcus viridans*, isolated from an appendix, was injected into a rabbit. A leucocyte count was done on the animal every hour until very late that night, and again the next morning. At 10.30 a.m. the rabbit was seized with a violent convulsion, and throughout the day had half a dozen more. It died that night and, on post-mortem examination, the brain showed several hemorrhages, which would easily account for the convulsions.

That day we injected another rabbit with the same organism and went through the same procedure. On the following day, at about the same hour, that animal went into convulsions and exhibited similar post-mortem findings.

We thought possibly the constant irritation, caused by the frequent bleeding from the ear, might be the explanation of this curious phenomenon, so the next rabbit we decided that no blood counts should be made. Nevertheless, that rabbit also developed convulsions, during one of which the hind limbs were paralyzed, which at autopsy was shown to have been caused by hemorrhage into the spinal chord.

There are two ways in which dental infections prove a menace to health and life. First, simply by the poisons set free from the dead bacteria as they disintegrate in dental abscesses and pyorrhoeal pockets. This in itself is a very serious factor. Many patients, with no apparent focal lesions, nevertheless show this effect by their general run-down condition and anæmia. Secondly, by the organisms gaining their way through these dental infections into the blood stream. Once there they may produce the characteristic lesions of endocarditis, arthritis, appendicitis, gastric and duodenal ulcers, etc. When this conception of the importance of dental infections takes hold of the rank and file of the profession, the plea for prophylactic dentistry will be accorded a more intelligent reception.

I have been asked to say a few words regarding the relation between medicine and dentistry, and I do so with a great deal of hesitancy, for fear of being misinterpreted. Really they are not two professions at all. Dentistry is fast becoming a special branch of medicine. Here we must be careful to make ourself perfectly clear. It is not belittling dentistry to say that it is becoming a special branch of medicine. Take, for example, the nose and throat specialist. Does he think that he is stepping down when he decides to devote his whole energies to one particular branch of his profession—a branch necessarily much more restricted than general practice? Or take, for example, the orthopedic surgeon. Does he feel that he is a less dignified or less useful man because he chooses to perfect himself in one line of effort. On the contrary, his prestige grows, his usefulness is often enhanced, and he enjoys a reputation that is often the source of envy to his less fortunate brother. The care of the sick and the prevention of disease is the scope of the profession of medicine. That includes the care of the mouth, and if you like, of the teeth. With the marvellous growth of knowledge in this great science, due largely to the development of research in the laboratories and clinics, the sum total of our knowledge in this connection has grown to inconceivable magnitude. The inevitable result is that one man simply cannot master all there is to learn. It is physically, as well as intellectually, impossible. What could be a more logical outcome, then, than the development of specialties, in one of which any man satisfactorily equipped with capacity and training, can reasonably expect to become a master? This division of labor is carried out in great detail. Take, for example, the science of pathology. Now, every medical graduate and every dentist is re-

quired to know the fundamental principles of pathology, and to be able to diagnose the typical lesions in the gross specimen, and in the section, but when operating upon a tumor of the breast, for example, the surgeon calls in the trained pathologist, and upon his decision rests the question of simple excision of the tumor, or radical removal with the glands of the axilla. But it becomes more complicated still when you remember that pathology includes bacteriology and immunology—and in no other branch of the healing art has there been so much recent progress as in the last mentioned. Therefore, if the practitioner of medicine or surgery wishes to be absolutely sure of his diagnosis of syphilis, or diphtheria, or such conditions, he calls in the bacteriologist or immunologist, and the one so called really assumes the role of consultant.

So in your branch. The practise of your profession should always be in closest touch with the other branches of medicine. Co-operation, consultation and team work should ever be on your minds. It is only by working harmoniously in conjunction with your co-laborers that the treatment will be of the highest order and the ideal results be attained.

But you ask—What about the patient? Whose is the patient? Who is going to take charge? All this talk is very well, but where does the patient come in? That is, indeed, a great question.

THE IDEAL RELATIONSHIP.

When the millennium comes—and it may be soon—I believe that question will be solved something after this way:

The very ablest of the profession of medicine will be called the internist, i.e., the man who treats diseases in general. The patient with endocarditis or appendicitis first applies to him for treatment. He discovers that this case has a focal infection about the tonsils or the teeth. If the former, he calls in the aid of the laryngologist, who removes the tonsils. The case, however, mark you, is in the hands of the internist. If there are alveolar abscesses he calls in the dentist. The latter, in that ideal time, will be so well trained and equipped that his judgment should be the final one as to the exact mode of treatment—for example, as to whether the abscesses should be drained through the root canal, with subsequent filling, or extraction, or otherwise. At the present time comparatively few dentists, and very few physicians, are in a position to give reliable opinions on that score. I feel that the dentist is the man who should decide, and it is for him to qualify himself to do it—and when he is qualified, he will soon be known.



MAJOR MAGEE AND SURGERY STAFF

C.A.D.C., Aldershot Camp.

Canadian Army Dental Corps, Military District No. 6, and Valcartier Camp

MAJOR GEORGE K. THOMSON, A.D.D.S., M.D , No. 6.

SO much has been written regarding the organization and work of the Canadian Army Dental Corps, and the readers of ORAL HEALTH have become so familiar with these matters that it is very difficult to write anything of particular interest.

One of the first districts in Canada in which the dental services were organized under the home service establishment, was M.D. No. 6, in November, 1915. This district includes the three Maritime Provinces. The writer, being transferred from the C.A.M.C., was appointed officer-in-charge with rank of Captain. In December, 1915, Captain J. M. Magee, Past-president of the Canadian Dental Association and Dominion Dental Council, was transferred from the C.A.M.C. to the C.A.D.C. and placed in charge of the St. John surgery. Lieutenant Gallagher was posted to Halifax to assist in the establishment of a surgery at that point. Subsequently Captain C. D. DesBrisay was transferred from the 75th Regiment and placed in charge of the Halifax Surgery.

Through the kindness of the Governors of Dalhousie University, the old medical college was loaned to the Militia authorities and almost ideal quarters were thus obtained for the dental corps. Many difficulties were met in the early organization of the dental services, but, fortunately, the local military authorities realized the importance of the C.A.D.C. and the requisitions and recommendations of the officer-in-charge were given every consideration. Equipment for the surgery in Halifax and St. John was either borrowed or hired

and supplies, sufficient to "carry on" purchased locally so that early in January both surgeries were well established.

From this division the following officers proceeded overseas during 1914 and 1915, attached to the C.A.M.C. or C.A.D.C.: Captains F. W. B. Kelly, H. C. MacDonald, E. McNeill, B. L. Neiley, K. F. Woodbury, H. P. Travers, Chas. E. McLaughlin and A. R. Currie.

The following have proceeded overseas during 1916: Captains C. D. DesBrisay, H. Clay, J. P. Gallagher, O. Nase, T. E. E. Robins, R. W. Frank, K. Daman, W. R. Fraser, B. Romell, F. E. Smith, A. J. LeBlanc, E. A. Randall.

The following officers are at present on duty in this district: Major G. K. Thomson, Capt. J. M. Magee, Capt. H. L. Mitchener, Capt. H. E. Mann, Capt. F. A. Godsoe, Capt. F. E. Burden, Capt. S. S. Harvie, Capt. W. H. Steeves, Capt. A. J. Cormier, Capt. F. C. Bonnell, Capt. W. R. Wilkes, Capt. J. B. Brown, Capt. J. E. Jewett, Capt. F. G. Mann, Lieut. I. K. Farrar, Lieut. and Quartermaster L. J. O'Leary, Lieut. E. S. Millett.

Lieut. F. A. LeFurgey of Summerside was taken on the strength but died in September, 1916. He was a conscientious and capable officer and his demise was very much regretted.

In Halifax the Military Hospitals Commission decided to use as a hospital the buildings occupied by the Medical, Dental, Legal and Pharmaceutical Departments of Dalhousie University. This made necessary the removal of these departments to the old medical college occupied by the C.A.D. Surgery, and necessitated the removal of the surgery to the Technical College, where it is temporarily established under even more favorable conditions than before.

Recently, however, the Hospitals Commission has decided to build a hospital to accommodate 300 patients, and in this hospital it is expected that an ideal dental surgery, with ten chairs and modern equipment, will be established, in which returned soldiers as well as those proceeding overseas may be treated.

The dental staff will have the use of the hospital X-Ray apparatus and surgical operating room if a special operating room for oral surgery is not provided.

Capt. F. E. Burden, President of the New Brunswick Dental Society, is at present in charge of the Halifax Surgery and has been very active in connection with Patriotic Associations to provide funds for the corps in this district, for such equipment as is not supplied by the Militia Department.

Halifax being a military station with about four or five thousand troops, it is necessary to have a permanent Army Dental Surgery in the fortress, and it is expected that the Department of Militia will realize this necessity and provide quarters in keeping with the importance of the service. Plans for a surgery at Fort McNab are now under consideration.



Major Magee.

Major Thomson.

Major Bradley.

Capt. Burden.

C.A.D.C. OFFICERS M.D. No. 4 AND No. 6.

The following operations were performed in M.D. No. 6 during June, July, August and September, 1916, and include those of Aldershot Surgery: Number of patients treated, 5,014; number of patients completed, 940; number of dentures, 413; number of operations, 17,596.

ALDERSHOT CAMP, 1916

Captain J. M. Magee, A.D.D.S., Aldershot Camp, 1916, was confronted with many difficulties in connection with the organization and the administration of the dental services at the camp and found the position of the dental corps rather anomalous. Upon applying for accommodation for officers and men, Captain Magee was met by the statement, from the Senior Ordnance Officer, that so far as his department was concerned, there was no such thing as a Dental Corps. However, Captain Magee's experience in the militia stood him in good stead and he got his tents and arranged for subsistence of his staff notwithstanding. Great difficulty was also experienced in securing cover for operating and at the outset it was necessary to use a little cook-house about seven feet by nine feet as a dental surgery. Imagine two operators, two assistants, and two patients, with any kind of equipment, working in this "dog-house." That was rendering dental services under active service conditions. However, it is a long lane that has no turning. A new surgery building, though by no means finished, was sufficiently advanced early in July to permit our moving our chairs and the building was completed the last of that month.

For cabinets, Captain Magee had the carpenters construct, in the spaces between the windows, shallow cupboards wherein to keep supplies and instruments and articles of equipment not in immediate use, but thus made readily available.

The Dental Corps is deeply indebted to the Aldershot Camp Commandant for his sympathetic and kindly interest. Col. W. E. Thompson took almost as much interest in the success of the Dental Corps as if he were a Dental Surgeon himself, and often expressed the opinion that for meritorious service and value rendered, the members of the Dental profession giving up practice to serve their country, were certainly deserving of better pay than their present rank entitled them to. He also felt that, in proportion to the value of their services (in that through the dental surgeon's aid so many men were fitted for service who otherwise would have to be rejected) the ranks held by the Director and Assistant Directors were not adequate compensation, especially in view of the fact that those administering were professional men, specialists in their own calling.

VALCARTIER CAMP, 1916.

For some reason no provision had been made for dental services for Valcartier Camp, 1916, and when the attention of General Wilson, Commandant of the Camp, was directed to this fact by Major Bradley, officer in charge Dental Services, M.D. No. 6, he instructed Major Bradley to proceed to the camp with equipment and staff.

The conditions found there were anything but encouraging. The old building used by the Dental Corps in 1915 was in a very bad and leaky condition, and lacking heating and lighting facilities as well as space.

Was Major Bradley downhearted? No! Emphatically No! With his characteristic energy and optimism he proceeded to make the best of existing conditions, and when the writer (who had in the meantime unexpectedly received instructions from Ottawa to take charge of the Dental Services at Valcartier) arrived, he found the staff from M.D. No. 4 already hard at work under conditions which might have been expected at the front, but hardly in such a famous and historic camp.

Major General Wilson, Camp Commandant, was immediately interviewed with regard to increased accommodation, equipment and staff, with the result that recommendations for the acquirement of an additional building and plans for a modern Army Dental Surgery were approved. With the assistance of the Commandant, to whose quick perception of the importance of the work of the C.A. D.C. is largely due the success of the services in Valcartier Camp, nineteen officers with N.C.O's and batmen were on duty before the close of the camp.

An incident illustrative of the difference in our status at the opening and close of the camp may perhaps be mentioned. When the idea was suggested of utilizing part of a building allotted to another branch of the service, for our purposes, we were informed that it would be well to be satisfied with the accommodation we then



OVERSEAS DRAFT, C.A.D.C., FROM M.D. No. 6

Sailed December 15, 1916, on "Olympic."

had, as the dental officers were only "squatters" there, and it was possible that even the present accommodation might not be available for them, whereas at the close of the camp the whole of the additional building, with such alterations as were necessary to transform it into a modern Army Dental Surgery, was occupied by the C.A. D.C., and every battalion in camp expressed appreciation of the services rendered. Some "squatters" these dental officers.

At Valcartier and Aldershot Camps the term of A.D.D.S., to designate the officer in charge, was used for the first time, and he and his assistants were attached to the Headquarters Staff, an action which was much appreciated.

The kindness of the O.C. and Officers of the A.M.C. and the interest displayed in the services were much appreciated by our officers.

Baseball, lacrosse and quoit clubs were formed by the surgery staff, and instruction in physical training and drill was conducted during the summer. The superiority of the Dental "Quoiters" over those of other units was demonstrated on more than one occasion.

In his closing address to the officers at Headquarters Mess, General Wilson was particularly appreciative of the dental services, and the dental officers certainly appreciated his prompt approval of recommendations for the comfort and efficiency of the surgery staff.

In spite of the lack of accommodation, equipment, and supplies, during the early part of the camp, the following report of operations

was included in the report to Headquarters for the months of June, July, August and September: Number of patients treated, 8,465; number of patients completed, 3,126; number of dentures, 454; number of operations, 23,285; average number of operators, 13.

An illustration of the advancement of dental services in the army since the declaration of war is of interest. In 1914 at Valcartier Camp, there were on duty four dental officers under the direction of the A.M.C. to provide dental services for 3,500 troops. Only two officers were on duty at once, as there were only two equipments in the camp. Practically only extractions were performed and very few fillings. Captain Mitchener, who, with Captains Neiley and Kelly of M.D. No. 6 and Captain Bentley of Ontario, was on duty there, writes: "For a chair Neiley used a box, and I had two stakes driven into the ground with a board across for the men to sit on—two shorter stakes with board across on which I placed my foot and the patient leaned against my knee. Both Neiley and I had our "offices" at one end of the dispensing marquee of the two hospitals concerned. We usually started work about 7 a.m. and kept it up until 4 or 5 o'clock. Very few, considering the number of men, asked for dental treatment. All reports were made out according to C.A.M.C. (or R.A.M.C.) nomenclature."

In 1916 there were from eighteen to twenty thousand troops at Valcartier Camp, so that instead of one dental officer to 18,000 men, practically no equipment and under the direction of the Medical Service, as was the case in 1914, there was one officer with a full modern equipment and under the direction of the Dental Services, to each 1,000 men.

The following is a list of officers on duty in the dental surgery, Valcartier Camp, during 1916: Major G. K. Thomson, M.D. No. 6; Major F. H. Bradley, No. 4; Captain B. W. Brock, No. 4; Captain F. W. Howe, No. 2; Lieut. W. S. McLaren, No. 4; Lieut. S. P. H. Marlatt, No. 4; Lieut. H. R. Cleveland, No. 6; Lieut. T. E. E. Robins, No. 4; Lieut. F. E. Burden, No. 6; Lieut. S. S. Harvie, No. 6; Lieut. L. Lemire, No. 5; Lieut. H. E. Mann, No. 6; Lieut. K. Daman, No. 6; Lieut. H. A. McCrae, No. 4; Lieut. B. L. Washburn, No. 5; Lieut. F. W. Williamson, No. 5; Lieut. T. D. Campbell, No. 5; Lieut. J. A. LeBlanc, No. 6; Lieut. W. McKay, No. 4.

Too much cannot be said of the faithfulness of the N.C.O's and men of duty in M.D. No. 4 and No. 6, as well as Valcartier and Aldershot Camps. The boys were always ready and willing to do their duty day or night.

Through the efforts of Major Bradley, supplies of towels and other necessities were sent to Valcartier Camp by the Daughters of the Empire and the Red Cross Socitey of Montreal, and these were much appreciated.

An Invitation to St. Thomas

DR. F. E. Bennett, President of the Ontario Horticultural Society, has extended, through Oral Health, a cordial invitation to the members of the Dental Profession and their friends to attend the Tulip Festival to be held this year on May 11th, 12th and 13th, in the "Flower City." Visiting dentists will not only enjoy the wonderful display of thousands of tulips of almost every variety, but will also experience an object lesson of what may be done in horticulture from the standpoint of public service. This year over two hundred varieties will be shown as well as Hyacinths, Narcissi, and other spring flowers.

The exhibit will occupy, as last year, the entire floor space, comprising over five thousand square feet, of the Baldwin, Robinson Furniture Company's store. Exhibits will be sent from other societies throughout the province and many valuable prizes are offered. The boulevard beds of St. Thomas are celebrated throughout the province and in these twenty-five thousand tulips and other spring flowers of innumerable varieties will be in bloom. Besides this, thousands of these bulbs are planted around public buildings, homes, and in the parks. In Pinafore Park last fall, bulbs comparatively unknown, were planted by the thousands in the various woods and shrubbery beds for naturalization purposes. In fact the town will be a blaze of color. Everything about the show is free. The St. Thomas Society meets all expenses and extends a general invitation to the Dentists of Ontario and their friends to be present. Visiting dentists will also receive a warm welcome from the members of the Elgin Dental Society.

Mark off these dates on your appointment book and take a well-earned rest. If not too much trouble, drop a line to Dr. Bennett and tell him that you are going to be present.

A VARNISH CONTAINER.—Manufacturers have been singularly slow in grasping the proper kind of container that should be furnished with the various varnishes that are used to coat the modern silicates. Until they help us out the difficulty can be, in large measure, overcome by transferring the varnish to any sort of bottle with a ground glass cap instead of ground glass stopper. If the preparation is one that has ether as a solvent it is best to cut an air vent on the inside of the glass cap. This can be done in a moment with a sharp-edged carborundum stone. By thus allowing a slight air vent at all times the liquid will evaporate only very slowly and the neck of the bottle will stay in a clean and presentable condition a much greater length of time. Of course the liquid must be diluted from time to time by the addition of a small amount of ether.—*Arthur G. Smith (Dental Review).*

Microbes and Dentists*

By F. E. Stewart, Ph. G., M.D., Phar. D., Philadelphia, Pa.

THE Literature of Dentistry, especially during the past few years, is filled with information concerning infections of the mouth and their relation to systemic disease. It has been truly said that to the dental profession belongs great credit for the wonderful success of the propaganda against microbic infection of the mouth now attracting the attention not only of the medical profession but the public in general, resulting in the world-wide propaganda now being carried on by the educational institutions in this country and abroad. This splendid work is so largely altruistic in its character in defense of the public against the dangers resulting from a septic mouth, that there is some danger of forgetting that microbes are also warring against the dentists themselves and their families. Should the children of the shoemaker go bare-footed? Is it not just as important for dentists to consider their own defense and the defense of those depending upon them, as it is to defend the patients and the public in general? With this thought in mind, I am presenting to you the results of the latest researches concerning microbes, their methods of warfare, and our methods of defense, realizing that this subject is of special importance both from the point of view of the dentist as a practitioner in considering the principles underlying the use of methods employed for the treatment of mouth infections, and also from the point of view of the dentist himself, and his relation to microbic invasion.

BIRTH OF A NEW SCIENCE: IMMUNOLOGY.

The conception of *contagion*, or the communication of disease from person to person by contact, is very ancient, having been handed down from the time of Aristotle 384-322 B. C. In 1546 Francaster divided contagious diseases into two classes, those transmitted by direct contact, and those transmitted by substances capable of retaining contagious germs, as woolen garments, bed clothing, etc. It also was taught that contagious diseases were transmitted by breath, effluvia, etc. The term *infection* was applied to diseases produced by no known or definable influence of one person upon another, but where common climate, malarious or other widespread conditions were believed to be chiefly instrumental.

Ancient peoples attracted by the subsequent immunity enjoyed by persons who had recovered from the attack of certain diseases endeavored to render themselves immune by inoculating the disease virus taken from mild cases into their own bodies, hoping thereby to acquire immunity by a mild attack of the disease. Ancient kings

* Abstract of a paper read before the West Virginia State Dental Society, 1916.

and tyrants immunized themselves against certain poisons by taking them in small and increasing doses, and it is said that Mithridatis, the Great, King of Pontus, thus became immune to all poisons in his time. From these crude beginnings a new science has finally developed known as the "Science of Immunology."

INFECTION.

The Germ Theory of Infectious Diseases. Minute forms of life, far too small for observation by the unaided eye, were first seen and described by the Jesuit Kircher in 1659, and afterward by the Dutch linen draper, Leewenhoek, in 1675. These minute living organisms were first called "animalcula," but as knowledge concerning them developed, they were later christened "microbes," from the Greek word *micros*, small, and *bios*, life. The word *microbe* is now only used by the French. *Bacteria* is preferred in England and America.

During the century following the work of these pioneers, the efforts of investigators were mainly directed to the morphology and classification of these minute living creatures. In the meantime, thinking physicians began to suspect the causal relationship of microbes in certain infectious diseases. Their constant presence in the tartar from the teeth, in the intestinal contents, in water, milk and food, and in the dust floating in the air, was significant.

Plenciz, of Vienna, writing in 1762, not only expressed a belief in the germ theory of disease, but was the first to advance the doctrine that each disease had its specific germ, which grew and multiplied in the body and produced the various infectious diseases. But these speculations, unsupported by experimental data, produced but little impression upon the medical world and there was very little advance in the knowledge of the subject until nearly three-quarters of a century later.

The real advancement in the scientific development of immunology occurred along entirely different lines. The phenomena of fermentation had attracted attention of scientists, and there was much discussion of the process and its use. The philosopher, Robert Boyle, working in the seventeenth century, had prophesied that the mystery of infectious diseases would be solved by him who should explain the nature of fermentation. The subject attracted the attention of Cagniard-Latour, who, in 1835, detected and described the yeast plant on which the process of fermentation in beer and wine depends. The same discovery was made by the botanist, Schwann, in 1837, and was confirmed by Helmholtz in 1843. But it was left for Pasteur, a French pharmacist, to work out the problems of fermentation and connect them with those pertaining to infectious diseases. His observations were published in 1858, 1860 and 1863.

Pasteur had been carrying on his work along the lines suggested by Cagniard-Latour and Schwann. His researches not only con-

firmed their findings in regard to fermentation in beer and wine by yeasts, but he was able to show that a number of other fermentations, such as butyric and lactic fermentations, are also due to micro-organisms.

The discovery that micro-organisms cause putrefaction influenced medical research most profoundly. Suppuration in wounds had long been regarded as a kind of putrefactive process, and Lord Lister, guided by the researches of Pasteur, introduced into the treatment of surgical wounds the principles of asepsis which made aseptic surgery possible.

About 1850, Pollender found minute rod-shaped bodies in the blood and spleen of animals dead with anthrax. Soon after, Davaine identified these little rods as the special virus of the disease. He proved that the disease could be transmitted from animal to animal by means of blood containing these rod-shaped bodies, and could never be transmitted by blood from which they were absent. Anthrax, or splenic fever, was thus proved to be due to bacteria, and the name *Bacillus anthrax* was given to the causative germ. This was substantial proof of the germ theory. The belief is now entertained that infectious diseases are groups of reactive symptoms produced by the resistance of the tissue cells to the bacteria cells, and that the process is one in which enzymes or digestive ferments secreted by both combatants, play a most important part.

The germ of relapsing fever was next discovered, credit for which belongs to Obermeier, who in 1868, found a spirillum in the blood of patients suffering from that disease. Then followed a period of much work, and many alleged discoveries and fantastic theories, and very little advance, owing to the want of proper technic.

Robert Koch, of Germany, now took part in the work, and in 1880 introduced the technical methods which made of bacteriology an exact science and opened the door to the new science of immunology.

With the publication of Koch's work, bacteriology and immunology entered a new era. The introduction of solid culture media, methods for the isolation and study of micro-organisms in pure culture, the use and development of aniline dyes for staining, by Wiegert, Koch and Ehrlich, the perfection of the microscope, and the adoption of Koch's postulates for testing the claims of alleged discoveries, were all important factors of progress. As the result of these improved technical methods half-finished work held in check for the want of proper technic was now given opportunity for development and new discoveries were rapidly announced.

Coincident with the explanation of the cause of infectious diseases and the phenomena which accompany their development, the subject of immunity or resistance to infectious diseases became the subject of researches which have led to great practical value.

More than half a century before the time of Pasteur, Jenner had succeeded in perfecting his method for vaccinating against smallpox. It was known to Jenner that the peasantry in England believed that milkmaids who had contracted sores from milking cows affected with cowpox were immune to smallpox. His investigations on this subject led to the publication of his famous monograph entitled "An Inquiry into the Causes and Effects of Variolæ Vaccine," published in June, 1798. The evidence contained in this monograph was so convincing that within a year or two vaccination against smallpox became general over the continent of Europe.

Pasteur more than fifty years later, philosophizing on this subject, and stimulated by the brilliant results obtained by Jenner by vaccination with the entirely innocuous pustules of cowpox, realized the possibility of immunizing against infectious diseases by using weakened, attenuated, or modified infectious agents without exposing the individual to the danger of infection from the fully potent virus.

Pasteur came to the conclusion that the vaccine or cowpox is smallpox, the virus of which had been attenuated by its passage through the cow, and that, consequently, when a person undergoes vaccination, he is thereby inoculated with a benign form of smallpox. The protective inoculation against pleuro-pneumonia, which had long been practised, gave encouragement to this hope.

The investigations of Toussaint were of value to Pasteur in solving the problem. Toussaint heated the blood of a sheep which had died of anthrax, to a temperature of 55° C. for ten minutes, then injected it into a number of sheep. Some of the animals died of anthrax and others recovered after a mild attack. The latter were found to be immune to a subsequent inoculation with virulent blood. Pasteur concluded the deaths were due to spores which had not been killed by the heat employed. By growing the bacillus of anthrax at a temperature of 42° C. he obtained a culture of low virulence which did not form spores. When sheep were treated with this virus they had a mild attack of the disease, which rendered them immune to virulent cultures. This culture afterwards became known as Anthrax Vaccine. He tried similar experiments with other animal diseases of infectious origin, with the result that successful vaccination against chicken cholera and swine cholera were developed.

His next experiment of importance resulted in the discovery of a method for immunizing against hydrophobia. Recognizing that the infected spinal cord of an animal dying from hydrophobia is, in fact, a fully developed culture of the virus, he invented a method for attenuating its virulence. This was accomplished by drying the cord in a closed vessel over a hygroscopic substance. He found that the virulence of the cord could be lessened and controlled by the drying process.

Guided by these experiments, Pasteur accomplished his purpose

and gave to medical science knowledge of the methods for so modifying infective agents that when introduced into the body they produce immunity without endangering the life or the health of the individual.

Thus was born the new science of immunology which has already revolutionized our knowledge of the etiology of many of the most important diseases, and placed in the hands of the medical profession the means for artificially producing immunity against these diseases, and new and more scientific methods for their treatment.

SOURCES OF INFECTION.

Bacteria pervade the air we breathe, the water we drink and the food we eat. Millions of them are taken into the nasal passages with every breath. Millions more are taken into the mouth and carried into the alimentary canal. Still further millions light upon the skin. What becomes of these bacteria?

Most bacteria when placed upon living tissues are unable to attack it and soon die; but when they are placed upon the same tissues that are dead, they feed upon it readily. When the tissues have been lowered in their resisting power by luxury, impoverished diet, enervating habits, fatigue, exposure or worry, the power of producing enzymes or antibodies which protect the tissues from the attack of microbes is so diminished that the bacteria have an opportunity to obtain a foothold and commence to grow and multiply at the expense of the tissues themselves. They are no longer saprophytes or feeders on dead matter, but parasites living at the expense of the tissues.

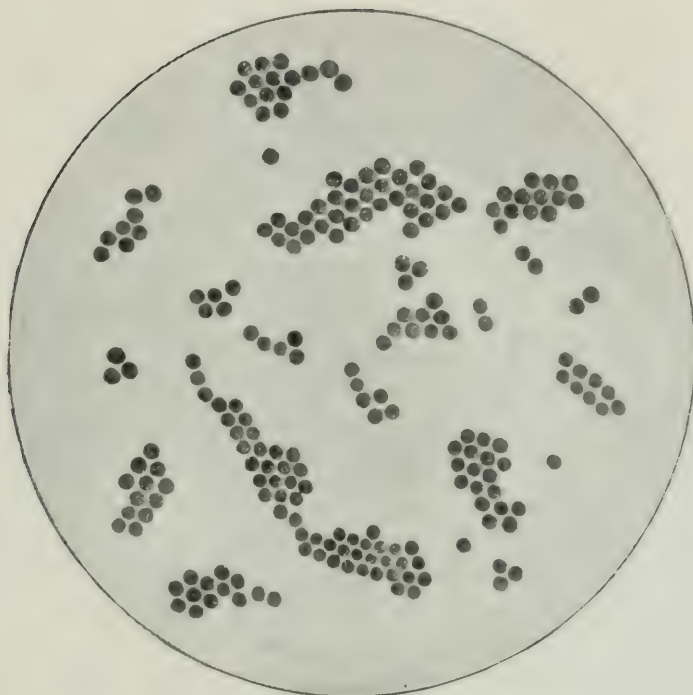
*The Mouth and Intestinal Canal as Sources of Infection.** Miller, in his book published over twenty years ago, claimed to have isolated "more than one hundred different kinds of bacteria from the juices and deposits in the mouth." The staphylococcus and streptococcus are permanent residents; the pneumococci is found in about ninety per cent. of persons examined. The streptococcus is always present.

Examination by Dr. C. P. Brown,** of the Mulford Laboratories, of the pus pockets of pyorrhea alveolaris, secured by Dr. Joseph Head, of Philadelphia, demonstrated the almost universal and continual presence of six kinds of bacteria, namely: *Bacillus influenzae*, the streptococcus, staphylococcus, pneumococcus, *Micrococcus catarrhalis* and diphtheroid bacilli. Goadby found in the early stages of pyorrhea alveolaris, *Micrococcus catarrhalis*, *Bacillus septus*, *Micrococcus pneumoniae*, *Bacillus necrodentalis* (Goadby), streptococcus brevis, and *micrococcus citreus granulatus* (Freud). In the latter stages of the disease he found *Micrococcus catarrhalis* and streptococci of various types. Allen† considers that the spirochætes and

* Miller, "Micro-organisms of the Human Mouth," 1890.

** C. P. Brown, "The Bacteriology of Pyorrhea Alveolaris," New York Medical Journal, Dec. 20, 1913.

† R. W. Allen, "Vaccine Therapy, Its Theory and Practice," Blakiston, Philadelphia, 1913.



Staphylococcus.

Staphylococcus.—This genus or form of bacteria is made up of cocci (berry-shaped bacteria) aggregated into irregular masses resembling bunches of grapes, from which the genus derives its name. These micro-organisms occur in three groups named from the color of their cultures—*staphylococcus aureus*, *albus* and *citreus*.

The *staphylococcus* is the cause of boils, carbuncles, acne and various infections of the internal organs.



Streptococcus.

Streptococcus.—This genus or form of bacterial micro-organism is made up of cocci arranged like a chain or string of beads. "Strepto" is derived from the Greek word meaning chain. Like the *staphylococcus*, it may cause inflammation and suppuration in all parts of the body. It plays a very important part in diseases of the mouth, throat, nasal passages, bronchial tubes, lungs, heart, joints and various internal organs.

spirilla found in the mouth are connected with, if not responsible for, the severe anemia which is sometimes met with in cases of pyorrhea alveolaris. Cummins[‡] considers the streptococci and the streptobacilli to be the germs usually immediately concerned in the arthritic and auto-intoxication processes sometimes connected with the pyorrheal infection. Rosenberg found on the mucous membrane pneumococci, streptococci, staphylococci and various bacilli, and around or in decayed teeth organisms which belong to the class of fungi (*Actinomyces*). According to the same authority, yeasts and moulds may also be present, as well as the *Micrococcus catarrhalis*. Spirilla are not uncommonly found, especially when decayed teeth are present.

These infecting micro-organisms having learned to grow at the expense of the tissues are the causative agents in pyorrhea alveolaris and other diseases of the mouth tissues. From the mouth they may find their way into the tonsils and from this focus of infection invade the entire system.

Osler, Cummins, Murphy, Knopf, Collier, Billings, Rosenow, Mayo, Hunter, Collins, Eyre and Payne, and many other authorities lay stress upon the danger of systemic infection from septic conditions of the oral cavity, and consider the diseased condition sufficiently wide-spread and injurious to warn the profession in regard to it as a serious menace to public health.

When the mouth is in septic condition the food may become a source of intestinal sepsis, or intestinal sepsis may arise from some other source, as for example, intestinal stasis, or, the two causes may be combined. Metchnikoff, in his remarkable contribution published in the *Revue Scientifique*, Vol. II, page 103, 1904, calls attention to the harmful action of microbes in this connection. He classes old age as a "disease originating from the insidious poisons of the vital organs of the body by toxins generated by myriads of toxigenic bacteria that infest the gastro-intestinal tract." He claims that these harmful micro-organisms can be displaced by a beneficent bacterial growth, thus saving thousands of lives and increasing the longevity of the race. His successful experiments along this line in the treatment of his own case led to his final introduction of the Bulgarian lactic acid bacillus as a therapeutic agent.

IMMUNITY.

The term "immunity" signifies non-susceptibility to a given infectious agent, either under natural conditions, natural immunity, or under conditions artificially induced—acquired immunity. The term "immunity" has only *relative* significance. For example, a man or animal may be exempt from a disease under natural conditions, and

[‡] Robert C. Cummins, M.B., "The Results of Auto-Intoxication Taking Place From the Mouth in Oral Sepsis, and Its Treatment by Bacterial Vaccines," *Journal of Vaccine Therapy*, March, 1913.



Pneumococcus (diplococcus of pneumonia).

Pneumococcus.—This form of bacteria is made up in pairs of cocci united or arranged so as to produce oval or oblong shapes. The pneumococcus is the cause of lobar pneumonia, and is also capable of causing pleurisy, peritonitis, meningitis, inflammation of the internal ear, inflammation of the eye, the joints and internal organs. It is the cause of severe forms of catarrh of the respiratory tract, and may cause bronchitis or asthma, or it may be one of the infecting micro-organisms in pyorrhea alveolaris, a mixed infection in which several kinds of bacteria, and also the ameba buccalis (protozoan), may take part.



Mixed Infection.

Mixed Infection.—Many infectious diseases are due to the presence of more than one pathogenic micro-organism. The above illustration is one of mixed infection in tuberculosis. There are present the typhoid bacilli (little rods) and the streptococcus (cocci in the form of chains). Some of the tubercle bacilli have been engulfed by the phagocytes, as shown in the illustration. Persons rarely, if ever, die of pure tubercular infection, the cause of death is due to the breaking down of the lungs by the presence of other micro-organism, especially the streptococcus.

yet the infective agent may be capable of producing it when introduced in sufficient quantity. On the other hand, the natural resistance to an infectious agent, even when very high, may be augmented by artificial means.

In the case of certain diseases, one attack confers immunity against another attack for many years, sometimes practically for a life-time, as in smallpox, yellow fever, typhoid fever, etc. In the case of other diseases a person may suffer from several attacks, instanced by influenza, pneumonia, diphtheria, etc. However, in relation to the second group, experimental research has demonstrated that in many of them a certain degree of immunity does follow; and it is considered highly probable that an attack of any acute infectious disease confers immunity for a longer or shorter period.

THEORIES OF IMMUNITY.

The following theories are different methods of explaining certain observed phenomena concerning infection and immunity. The authors differ in their methods of expression, but all agree in regard to the correctness of the phenomena themselves.

Pasteur's Exhaustion Theory. Pasteur's views of immunity were based upon the supposition that the animal body was a mere culture medium for the growth of micro-organisms and that immunity was produced when the food upon which the bacteria were nourished was exhausted or used up. The prolonged absence of the proper nutritious substances would account for the more or less permanent nature of the acquired immunity. This was well known as the *exhaustion theory* and still exists in a modified form.

Chauveau's Noxious Retention Theory. Chauveau maintained that during the course of a disease the bacteria produce substances in the presence of which they cannot develop further; consequently, recovery takes place and the continued presence of these noxious substances renders another attack of the disease impossible.

Metchnikoff's Phagocytosis Theory. Before Metchnikoff advanced his theory of phagocytosis it was already known that the amœboid movements of the leucocytes enabled them to take up foreign particles into their interior. Virchow was aware that leucocytes increased in certain septic conditions; Panum (1874) and Rosser (1881) had suggested that bacteria might be ingested by leucocytes. But it remained for Metchnikoff to develop the idea that the body cells normally possess the power not only of ingesting but of digesting and destroying foreign particles and fragments of dead tissue. This process he named "phagocytosis" (from the Greek, *phagein*, to eat; *kutos*, cell). Since that time Metchnikoff has evolved his well known theory of phagocytosis.

Metchnikoff believed that the enzyme elaborated by the body cells destroyed not only bacteria but their products as well, so that

immunity may mean either destruction of bacteria or destruction of bacterial products. He and his followers considered it probable that the same agent destroys the bacteria and neutralizes their products.

To sum up Metchnikoff's theory, immunity does not always depend upon the same fundamental reactions. It may depend upon the incorporation and destruction of bacteria by body cells, or upon the destructive action of body juices into which the cellular enzymes have been discharged; or, when micro-organisms are not directly engaged in the production of disease, and the morbid changes result from the presence of a toxin, as in diphtheria and tetanus, immunity may depend upon the action of one of these enzymes on the poison introduced. According to this conception, therefore, diphtheria antitoxin must protect either through the action of cellular enzymes which it contains already formed, or by stimulating the formation of protecting enzymes within the body.

Wright's Opsonic Theory. Following up Metchnikoff's phagocytic theory, Wright demonstrated that the function of the antibodies called opsonine is to prepare bacteria for ingestion and digestion by the leucocytes. The name opsonin is from the Greek word "opsono," meaning, "I prepare food for."

According to the opsonic theory of immunity, there are normally in the blood, opsonins specific to each kind of disease-producing bacteria. When a germ invades the body the tissue cells immediately produce a large amount of antibodies, including opsonins. In the meantime, the leucocytes, or phagocytic corpuscles of the blood, rush to the site of invasion to repel the bacteria by ingesting and digesting them, or, in other words, eating them up. This the phagocytes cannot do until the bacteria have been prepared to be eaten by the opsonins.

Thus we see that immunity to disease germs is produced in the healthy animal body by the action of the disease germs themselves, which have the power of stimulating the tissue cells to produce antibodies. Some of these antibodies destroy the bacteria or render them inactive and others aid the phagocytes to ingest them.

Vaughan's Parenteral Digestion Theory. Vaughan teaches that infection and immunity are due to parenteral digestion. Parenteral refers to digestion carried on by the body cells outside of the alimentary canal. Bacteria are living proteins. When bacteria invade the body and become parasites, living at the expense of the tissues, the body cells become "sensitized" and react against them. This reaction consists in the elaboration by the body cells of a powerful, specific, proteolytic ferment or enzyme which splits up the bacterial protein into two portions, namely: a poisonous portion consisting of the archon or keystone, or central atomic group of the protein molecule; and a secondary group which is non-poisonous. The former produces the toxic symptoms of the disease; the latter stimulates

the body cells to elaborate more of the specific proteolytic enzyme referred to. In case of recovery from an infectious disease, characterized by subsequent immunity, the protection against attack is due to the storing of zymose in the tissues and the power thus acquired by certain tissue cells of producing enzymes promptly on re-exposure to the same infecting agent.

Vaughan^{††} calls attention to the fact that the protoplasm contents of the microbic cells and the body cells are living proteins, and that this fact is pivotal in the study of infection and immunity. Foreign living protein (bacteria, protozoa, etc.) can grow and multiply in the human body only if the invader is capable of digesting and utilizing the living protein of the body and converting it into the same kind of protein as that of the invader. This it is able to do only by means of its digestive ferment, and this must act upon the protein of its body cells and digest it. If the digestive ferment or enzyme of the bacterial cell cannot digest and prepare food for the bacterium from the body protein (protoplasm) then the invading bacterial cell dies. If the digestive ferment produced by the body cell is rapidly and thoroughly destructive, there is no bacterial development and the organism is innocuous. If the digestive ferment of the bacterial cell is sufficiently potent to digest the protein of the body cell, then the bacterium becomes a parasite and lives at the expense of the animal tissues and the result is seen in the phenomena we know as infectious diseases.

According to Vaughan, all true proteins are constructed upon the same general plan, and consist of a central group, keystone or *archon*, around which are arranged sub-groups. The central group is common alike to all proteins. It is a *poison*, but not a toxin; that is, it is incapable of stimulating the body cells to produce an antitoxin when introduced into the animal body. Its poisonous properties are due to its powerful affinity for the secondary group of other proteins. The secondary group or groups of each protein molecule is specific. The power of the protein to stimulate the body cells to produce a specific proteolytic enzyme resides in the secondary groups.

The infective agent, antigen or sensitizer, in a case of typhoid fever, is the typhoid bacillus. It is infective because by means of its digestive ferment it can feed on the protein of man's body. This means that it can convert man's protein into typhoid protein and thus multiply its kind. Moreover, it is not, immediately on its entrance in man's body, destroyed by the ferments of the body cells. Having found admission to the body it proceeds to grow and multiply. This continues through the period of incubation, which in this disease is somewhere about ten days. During this period of incubation there is no effective resistance on the part of the body cells to the growth and multiplication of the foreign protein. During this time the man is

^{††}"The Protein Split Product in Relation to Immunity and Disease," Victor C. Vaughan, M.D., LL.D., and Co-laborers, Lea and Febiger, 1913.

not sick, and we conclude therefore that it is not the growth of the foreign protein which *per se* gives rise to the symptoms of typhoid fever. However, during this time the body cells are being prepared for their combat with the foreign protein. This preparation consists of the development in certain of the body cells of a new function, that of elaborating a new and specific ferment which will digest and destroy the foreign protein. When this new ferment begins its action the first symptoms of the disease appear. The active stage of the disease, with its symptoms and the lesions induced, marks the period over which the parenteral digestion of the foreign protein exists. Death may come from the too rapid breaking up of the foreign protein and the consequent liberation of a fatal dose of the protein poison, which is always formed on the disruption of the protein molecule, or it may result from some lesion induced by the products of this disruption, such as perforation and hemorrhage, or it may follow from chronic intoxication and consequent exhaustion. In case of recovery, the individual is, for a time at least, immune to the typhoid bacillus because his body cells are now able to elaborate and make immediately effective the specific ferment which destroys the typhoid protein.

To this stimulating action of the secondary group of the protein molecule upon the body cells which causes the development in the body of the man of a specific proteolytic enzyme, Vaughan has given the name "protein sensitization." "There is developed in certain body cells a new function, that of elaborating this new ferment."

Certain body cells have now acquired the property of producing enzymes and antibodies promptly; the individual is therefore *immune* to further attacks of typhoid fever, because upon subsequent exposures the body cells destroy the typhoid bacillus without the production of any noticeable reaction.

Sajous' Internal Secretion Theory. Wright concluded in 1904 that the "protective substances which were involved in the cure of disease and that were present in considerable quantities in the blood were to be regarded as produced by internal secretions." He added, however, that he "did not know where they were produced in the body." Sajous had one year earlier, in his work on the "Internal Secretions," claimed that the thyroid, adrenals and pancreas were the source of internal secretions known as antitoxic, and that it was these secretions which endowed the blood and Metchnikoff's phagocytes with their immunizing power. He also claimed (1907) that Wright's opsonin was the thyroid secretion. The researches of Fassin in Belgium, and of Stepanoff and Marbe at the Pasteur Institute, favor Sajous' observations.

Sajous' theory is that bacterial vaccines excite the centers that govern the above glands, and by thus increasing the secretory activity of the latter, cause the appearance in the blood of the protective substances to which Wright refers.

Ehrlich's Side-Chain Theory. Ehrlich's hypothesis is based on the mechanism of cellular nutrition, so that, as Welch has pointed out in his Huxley lecture on immunity, the two theories have this viewpoint in common. Ehrlich conceives the structure of protoplasm to be extremely complicated and characterized by enormous numbers of side-chain or groups of combining molecules—a conception borrowed from the structural diagrams of organic chemistry. These side-chains—each being a definite molecular group—are supposed to have specific combining affinities. It is through the combination of particular molecular groups with appropriate groups in the tissue juices that cellular nutrition and metabolism are supposed to be maintained.

These side-chains are called receptors. Now, cells have receptors not only for substances which are beneficial to them, but also for substances which tend to destroy them. It is through these receptors that bacteria by means of their toxins and other metabolic products attack the cell. When a cell has been set upon and injured, the reparative powers of the body exercise their function and one evidence of repair is the production of more receptors. As Nature is prodigal in all her reparative processes an excess of receptors is manufactured and some are crowded out into blood and tissue juices. A large number of these receptors floating in the blood gives to the serum antitoxic and antibacterial powers.

Sensitized Vaccines. Besredka, in explaining the action of sensitized vaccines, refers to the researches of Garbat and Meyer. These investigators claim that bacteria are typical cells consisting of an external protoplasmic envelope and internal nuclear portion. When the bacterial cell is disrupted, the outer portion is digested and the inner portion set free. Both portions are toxic; both give rise to individual immunizing substances by stimulating the tissue cells to produce them. The inner portion of the bacterial cell is the endotoxin; therefore, according to this view, part of the immunizing action is due to anti-endotoxin. Vaughan explains the apparent difference between his views and those of Besredka in a communication to the author of this paper.

NATURAL LINES OF DEFENCE AGAINST INFECTION.

Nature has prepared certain lines of defence against bacterial invasion which should be understood and guarded to prevent infection.

First Line of Defence. The first line of defence is the mechanism of the skin and mucous membranes. The skin is provided with a layer of epithelial cells, more or less dry and horny, which is constantly exfoliating, carrying with it the bacteria which find lodgment on the surface. The glands of the skin secrete aqueous (sweat) and oily (sebum) secretions, which, flowing outward, hinder microbes from obtaining a foothold. The mucus which entangles microbes and carries them off, often aided by hair-like *cilia* which keep the secretions in constant outward motion.

Microbes, like other foreign substances, irritate the mucous membranes by contact and greatly augment their secretions, flooding the membranes and carrying off the microbes. Sneezing and coughing aid the respiratory passages in getting rid of microbes.

Second Line of Defence. The second line of defence pertains to the body cells and their destructive enzymes, also to the blood and lymph. When microbes succeed in penetrating the first line of defence and commence to grow and multiply in the tissues, the tissue cells at the point of invasion are stimulated to produce specific proteolytic enzymes or digestive ferments for their destruction. Leucocytes in enormous numbers are rushed to the infected area (leucocytosis) to aid the tissue cells in their fight against the invaders.

Inflammation and Fever. The phenomenon of inflammation is now considered to be a reactionary effort of defence against bacterial invasion. The area of invasion is generally local, and the defensive effort against it is generally successful. When the bacteria multiply in the blood stream itself we have septicemia, in which the phenomena of inflammation are scattered over various areas or are absent altogether. This is commonly a fatal condition; but there are few septicemias which are not secondary to a primary local infection.

It has been pointed out that a raise in temperature which habitually attends acute inflammation is a factor in the line of defence, and that a raised body temperature is inimical to pathogenic bacteria, attenuating their harmful properties. This may explain the fact that some good results follow large doses of bacterial vaccines—doses sufficient to give a marked reaction—where smaller doses have failed.

Antigens and Antibodies (Amboceptors) and Complement. The formation of so-called antibodies in the blood serum of an individual subjected to an attack of invading bacteria is part of the second line of defence. As already stated, Metchnikoff claims that the power of the blood and other body juices of dissolving and destroying bacteria and other foreign digestible substances is imparted to it by the phagocytes. The breaking down of the phagocytes (phagolysis) sets their enzymes free which are thus discharged into the body fluids, imparting to them the same power possessed by the phagocytes themselves.

Enzymes are produced by the body cells (including leucocytes) when bacteria penetrate the first line of defense or when they are introduced into the body artificially for immunizing purposes. Practically any protein substance may serve as an antigen and cause the production of a digestive enzyme. The digestive ferment produced by the body cells in response to stimulation by the antigen is *specific*. In other words, it will only digest the particular kind of protein introduced into the body and no other kind. For instance, if egg albumen is used as an antigen, the body cells are stimulated to produce a specific digestive ferment capable of digesting egg albu-

men, but not capable of digesting any other kind of protein substance. The same applies to serum albumin and globulin, milk casein, epithelial cells, vegetable albumin, etc. It also applies to bacterial protein. Each kind of bacterium requires a specific digestive ferment or enzyme for its digestion.

When a small quantity of serum from an animal, previously injected with an antigen consisting of a certain microbe (bacterium, for example) is added to a suspension of its corresponding microbe, the organism becomes agglutinated into clumps, and motility (motion) is suspended or destroyed. Such serum may not only cause agglutination, but when added to the filtrate of a culture of the corresponding microbe, may produce a cloudiness, and afterwards a precipitate. It is therefore assumed that these several actions are due to certain principles developed in the blood of the animal during the process of parenteral digestion, to which the name "*antibodies*" has been given. The bactericidal and lysogenic action is assumed to be due to the presence of bacteriolysin. Some authorities believe that the body fluids also include *bactericidin*, which has the power of killing bacteria without dissolving them. The opsonic action is assumed to be due to the presence of *opsonins*. Agglutination and precipitation are assumed to be due to the presence of *agglutinins* and *precipitans*. Vaughan believes the phenomena produced by the so-called antibodies are attributes of the digestive ferments or enzymes already described.

Amboceptor and Complement. The relation between antibodies and antigens is dependent upon the presence of complement—a constituent of normal blood serum. The various antibodies play the part of connecting links between complement and antigen, and are therefore classed under the general term "amboceptor." The term "amboceptor" implies a two-armed substance. One of the arms is connected with the antigen, the other with the complement. Until this union is completed, complement cannot act upon antigen.

Complement, which is normally present in the blood serum of all animals and man, is spoken of under various names, such as *complement* (Ehrlich), *alexin* or *cytase* (French authors). It is relatively unstable, being rapidly destroyed at 60 C. It is not specific; it is not increased to any marked extent by the process of parenteral digestion. Its function is to dissolve, agglutinate, precipitate or otherwise act upon antigens, according to the nature of the specific amboceptor present.

THE ARTIFICIAL PRODUCTION OF IMMUNITY FOR THE PREVENTION AND CURE OF INFECTIOUS DISEASES.

Smallpox Vaccine. The fascinating study of the production of immunity against poisons and diseases dates back to remote times. Centuries before the Christian era the Chinese observed the immunity

against a second attack enjoyed by those who had smallpox. By inoculation, *i.e.*, artificial transfer of the smallpox virus, they endeavored to check the spread of the disease. The inoculation was carried out by placing smallpox scabs in the nose, rubbing into the skin, etc., and, strange to say, its entrance in this manner did seem to almost invariably result in a mild case of smallpox, recovery from which left the patient immune. The practice was also later extensively employed in Europe, but after a time it became evident that, while the immunity was secured in the inoculated person, the disease thus induced could be spread as rapidly as in the natural form. Indeed, it is thought that the severity of some of the widespread and fatal epidemics was greatly enhanced by this procedure.

The first really scientific step in the production of artificial immunity against smallpox may be accredited to Edward Jenner, an English physician (born in 1749, and died in 1823), who, in 1789, announced that immunity to smallpox could be produced by vaccination.

The peasantry in various parts of the world, particularly in England, believed that sores on the hands of persons who milked cows affected by cowpox conferred immunity from the disease. It is said that in Dorsetshire, an English farmer, Benjamin Jesty, successfully vaccinated his wife and two sons as early as 1774, from a cow-pock on himself. In 1791 Plett, a Holstein schoolmaster, vaccinated three children, in one case on the finger tips, which caused inflammation of the arm and deterred him from repeating the experiment. These three children escaped the epidemic in 1794.

Jenner, while a student, learned of the traditions on this subject and mentioned them to his preceptor, John Hunter. He settled the question in 1796, when he vaccinated a boy, James Phipps, with matter from a kine-pock on the hand of a dairy maid, Sarah Nelses, and on July first introduced into this boy infectious matter from a smallpox pustule without effect. Two years later, in June, 1798, he published "An Inquiry into the Causes and Effects of the Variolæ Vaccine," illustrated by four plates, and within a year or two vaccination became general over the continent of Europe.

In May, 1800, vaccination was adopted in the English Army, and shortly afterward in the Navy; and in July of the same year a declaration was signed by many of the medical men in London expressing their confidence in its practice.

Vaccination was introduced in the United States July 8, 1811. Benjamin Waterhouse, "Professor of Physick," Harvard University, vaccinated his own children, and John Coxe, of Philadelphia, vaccinated his oldest child about the same time, and then tested the experiment by exposing him to the influence of smallpox. The reliance on the protective power of vaccination in America was strengthened materially by this bold act. President Jefferson was

instrumental in introducing vaccination in the Southern United States.

Immense Benefit Conferred Upon Humanity by Vaccination. The immense benefit conferred upon humanity by vaccination may be estimated from the following facts and statistics:

In the early part of the nineteenth century, when smallpox, which at first assumed form in Europe about 1700, had become a veritable scourge, it suddenly began to decline, and this decline continued for decade after decade until the disease lost its terrors and the great majority of physicians had never so much as even seen a case. How was this almost miraculous fact to be accounted for? There can be but one reply to this query: the introduction of protective vaccination by Jenner and its general adoption has controlled and practically eradicated smallpox.

Thanks to the work of Pasteur in discovering the microbic causes of disease and the nature of disease germs, attention was called to the danger of contamination from this source, and the production of vaccine virus was placed on a scientific basis and is now under government supervision. In the production of vaccine, as carried on by modern laboratories, absolute safety is insured.

BACTERIAL VACCINES.

Bacterins. The term "bacterial vaccine" was applied to this class of products by Wright because they are used for producing immunity against pathogenic bacteria similar to the immunity against smallpox produced by the use of bovine vaccines. But the name "bacterin" has been proposed as more appropriate than "vaccine," because the latter term refers more properly to Jennerian vaccination. In this paper I have used the term "bacterin" as synonymous with "bacterial vaccine," with the distinct understanding on my part that this name is free to science and commerce and is not controlled by any manufacturing house. The name first appeared in Cohen's "System of Physiologic Therapeutics," Vol. XI., 1905.

Bacterins (or bacterial vaccines, as they are termed by Wright and his followers) are killed pathogenic bacteria suspended in sterile physiological saline solution protected by antiseptics from contamination, and standardized to contain a definite number of bacteria in each c. c. Bacterins, like other vaccines, are modified disease viruses, so modified that they are no longer capable of growing and multiplying in the body, but not so modified as to destroy their power as antigens; consequently, when they are introduced into the body, they stimulate the body cells to produce the specific amboceptors, opsonins, enzymes or antibodies, which have the power of destroying the invading micro-organisms. The body cells having acquired the power of producing these antibacterial substances by means of this artificial stimulation are in a condition to promptly produce such antibacterial substances, when the individual is re-exposed to the same infection and therefore acquired immunity of longer or shorter duration.

Autogenous versus Stock Vaccines. Bacterins are prepared either from germs cultured in the laboratory, or directly from germs isolated from the patient. In the first case they are called *stock* bacterins, and in the latter autogenous *bacterins*. The question of stock bacterins versus autogenous bacterins is one concerning which there has always been much dispute. Some physicians claiming to be authorities, insist that autogenous bacterins should always be employed. Wright and his followers largely employ stock bacterins, and use autogenous bacterins only when stock bacterins fail, or when for any special reason autogenous bacterins are to be preferred. Stock bacterins are used exclusively in immunizing against typhoid fever, and owing to their power of stimulating the body cells to produce specific antibodies against typhoid bacillus, their employment has practically banished typhoid fever from the armies of the world. If autogenous bacterins are essential to success, it logically follows that diphtheria antitoxin, tetanus antitoxin and antibacterial serums are useless because they are stock preparations. It is well known that the contrary is the fact.

The fact is, that stock bacterins, especially if polyvalent, are as efficacious in many instances as are the autogenous bacterins. Reference to the writings of Cole and Meakins, Hamilton, Cooke, Hartwell and Lee, and other well known authorities, may be cited in support of this statement. Furthermore, polyvalent stock bacterins are infinitely to be preferred to autogenous bacterins as often prepared by persons not thoroughly trained in bacteriological technic.

Polyvalency. It is now considered that many of the early failures with stock vaccines were due to the use of a bacterin composed of but one variety of a certain species of bacterin. Bacterins, as now manufactured, are polyvalent; that is, they are composed of as many varieties of a given bacterial species as possible. The use of polyvalent bacterins has been attended with such success that the manufacturers are now producing almost exclusively stock bacterins and serums.

Negative and Positive Phases. Immediately after the injection of a bacterin there follows a period in which there is a decrease in the amount of opsonins in the blood of the patient due to their being used up by the killed bacteria injected. This decrease is known as the "opsonic negative phase," and is followed by an increase in opsonins known as the "positive phase." The negative phase will not be manifested clinically unless a sufficient dose is given to produce more than a physiological effect. In that case the negative phase is manifested by malaise, increased temperature and aggravation of the symptoms. This statement is in accordance with that of Wright, who says: "If a proper dose of vaccine has been injected no clinical symptoms should be produced even during the opsonic negative phase." Leary makes the same statement in other words in a paper read before the Rhode Island Medical Society, in which he says: "The ideal immu-

nizing response can be produced without the toxic negative phase. Physiological doses of vaccine should be followed by an immediate production of antibodies without toxic action." The same authority also states that in chronic diseases, except in tuberculosis, the injection of vaccine in considerable doses is followed by a temporary lowering of the patient's resistance, a frankly negative phase, which may exist for some time, during which period a further use of vaccine is not desirable and may be harmful. In acute conditions, when bacterins are used in proper doses, the negative phase is either ephemeral or absent.

ANTITOXINS AND ANTIBACTERIAL SERUMS.

When bacteria grow and multiply in the body, symptoms of poisoning (toxemia) are manifested, consequently it was inferred that bacteria either produce poisons during their growth or contain poisons. Subsequent experiments proved that the poisonous effects of a few bacteria are traceable to substances elaborated during the growth of the bacteria which pass out into the surrounding media, and the poisonous effects of the other class seemed to be due to the actual constituents of the bacterial cell. To the former the name exotoxins or extracellular toxins was given. The latter were named *endotoxins* or *intracellular* toxins.

Antitoxins. The injection of soluble toxins into the body stimulates the tissue cells to produce "antitoxins." These toxins when injected without the bacteria do not give rise to antibacterial substances.

Among the bacteria-producing soluble extracellular toxins or exotoxins, the bacillus of diphtheria and the bacillus of tetanus are the most important. Serum from an animal immunized by injecting into its body small and increasing doses of toxin, administered at regular intervals and given over a long period (months) of time, is rich in antitoxin. This serum when properly prepared, concentrated and standardized, constitutes the antitoxin of commerce. Diphtheria antitoxin and tetanus antitoxin are prepared in a similar manner. When these antitoxins are introduced into the bodies of other animals or man, they become temporarily immune to the toxin produced by the living organisms. Consequently these antitoxins are used for immunizing healthy persons against diphtheria and tetanus, as well as for their treatment.

SOME INFECTIOUS DISEASES IN WHICH BACTERINS AND SERUMS ARE SPECIALLY INDICATED.

Pyorrhea Alveolaris. This disease is associated with mixed infections in which the *endamebæ buccalis* (a protozoan) and the so-called mouth infection are etiological factors. Our knowledge of the protozoa in their relation to pyorrhea alveolaris is largely due to the work

of Barrett and Smith of Philadelphia, and Bass and Johns of New Orleans. The Philadelphia workers were unacquainted with the work carried on in New Orleans, which adds to the value of the investigations on account of their independent origin. To Dr. Claude P. Brown, working in the Mulford Laboratories, in co-operation with Dr. A. P. Hitchens, we are indebted for one of the most important contributions to the knowledge of bacteriology of pyorrhea alveolaris. The material for the bacteriological examination was collected by Dr. Joseph Head, of Philadelphia, from pyorrheal pockets in the mouths of patients under his treatment for the disease. The results obtained by Brown from the study of cultures from pyorrheal pockets in forty-eight cases, both as to technic and cultural methods followed, are carefully described and tabulated in his paper entitled "The Bacteriology of Pyorrhea Alveolaris," published in the *New York Medical Journal*, December 20, 1913.

As already stated, he found six kinds of bacteria universally and continually present, namely: *Bacillus influenza*, streptococcus, staphylococcus, pneumococcus, *Micrococcus catarrhalis*, and the diphtheroid bacilli. Reference to his findings was made on page 864 of the October *Dental Summary*, where will also be found a summary of the investigations of Goadby, Cummins, Rosenberger and others.

In the treatment of pyorrhea alveolaris resource was had to the use of emetine as a specific against the *endameba buccalis*. This amebicide, which has been so successfully employed by Rogers and others in the treatment of amebic dysentery, is recommended for the destruction of the ameba in pyorrhea alveolaris by Barrett and Smith, and also by Bass and Johns. Barrett and Smith treated locally thirteen cases by injecting into the pockets of infection between the teeth and the gums one-half of one per cent. of emetine hydrochloride. In several of these thirteen cases, the pus disappeared completely to gross inspection in twenty-four hours after application. This result was attained in all the cases after three daily local treatments. It is only where there is a wider distribution of the parasites, as in the tonsils, or where systemic complications exist that the hypodermic use of the drug is considered advisable by these investigators. Bass and Johns, on the contrary, are strong advocates of the hypodermic use of emetine. They find one-half to a grain, up to three grains of emetine given hypodermically is sufficient. According to these investigators the *endamebæ* disappeared from the lesions following from one to three days of hypodermic treatment in more than ninety per cent. of all the cases. They disappeared in ninety-nine per cent. following six days of treatment. They state that all cases should be treated at least three days and none more than six. Usually one-half a grain daily for three to six days, depending upon the case and the stage of the disease, is all that is required to accomplish the purpose.

For local application higher concentrations than one-half of one per cent. of the emetine hydrochloride is likely to provoke inflammatory reactions at the gums. Care should also be taken to use a neutral solution of the salt, as free hydrochloric acid is apt to be irritant to the gums and adjacent surfaces; the solution should also be isotonic with the blood, for it may prove irritating if used either in stronger or weaker solutions.

The solution is introduced into the pyorrhea pockets with an ordinary hypodermic syringe with a straight or special curved dental needle, as needed, so as to gain access to all parts of the pockets. Dr. Barrett particularly calls attention to the way of using the needle. The point should be rounded as it may pass along the root of the tooth to the bottom of the pocket, merely engaging with the wall, and be carried to all of its parts without penetrating the inner walls of the pocket of infection. Each pocket in turn is filled with the emetine hydrochloride solution, and Barrett believes it to be good practice to apply the solution also to parts which, according to gross examination, are not involved—as into the interdental spaces and around fixed appliances. “Treatments which thus include all recognizable pockets, and especially parts under suspicion, should be repeated daily for at least five days, and thereafter every other day until about ten treatments as a total have been made as a general rule.” He also recommends that “microscopic examination of scrapings from the pockets should be made from time to time for persisting endamebæ as the treatment progresses, and this, together with the general appearance of the lesions, will determine the appropriate duration of treatment. In some of the less marked and less chronic cases, a total of five or six applications or even less may be sufficient, while in the more stubborn instances treatment must be continued even longer than above indicated.

Every unhealed lesion must be regarded as a source of reinfection which will certainly promptly occur just as long as endamebæ are being constantly thrown off from the pockets of infection.

“Coincident with the disappearance of the endamebæ, the soreness, pain, or discomfort, and the amount of pus formed, rapidly decreases. The tendency to bleed from slight trauma usually ceases within forty-eight hours, and in almost all cases the patient recognizes and feels confident of the beneficial effects within a few days.”

Bass recommends a solution of one-half of one per cent. for the treatment of the pockets of infection. Vedder found that emetine kills the endamebæ when diluted one hundred thousand times, and Bass recommends its dilution with alcohol about ten times, and that one drop of this should be applied to a wet toothbrush and be used for washing the teeth; or two or three drops of the fluid extract may be added to half a glass of water and the mouth thoroughly rinsed with it at night before retiring. He also states that the endamebæ

contained in the pockets are destroyed by injecting one-half of one per cent. emetine hydrochloride solution into the pockets with a hypodermic syringe.

In the treatment of pyorrhea alveolaris the objects are first to destroy infecting micro-organisms; second, to get rid of the pockets of infection and prevent reinfection; and third, to restore the tissues to a normal condition as far as possible; fourth, to meet the indications arising from systemic infection.

The Use of Ammonium Biflouride. Dr. Joseph Head, of Philadelphia, uses ammonium biflouride in twenty per cent. solution (containing ten per cent. free acid) as an amebicide and bactericide. He also finds this solution an excellent solvent for the softening of tartar.

It is commonly believed that the accumulation of tartar aids in separating the gums from the teeth, and in the production of pockets of infection. To what extent the tartar accumulation is an etiological factor in pyorrhea is possibly an open question. However, there can be no question that it should be removed by the dentist. Head says that the ammonium biflouride solution not only destroys the infection and softens the tartar so that it may be readily removed by the scalers, but stimulates the tissue cells so that they form reattachment of the gum to the root, thus causing the disappearance of the pockets of infection, and getting rid of the self-perpetuating foci of infection. After four or five applications one week apart, black scales that have escaped the instrument will sometimes be found floating loose in the pockets of infection so that they can be readily picked out, and finally the root will become as soft as velvet to the touch of the instrument.

Head says that when this stage has been reached it will be found that the scalers cannot be carried as deeply into the pyorrhea pockets as in the beginning. To do so causes pain and a free flow of blood. This indicates that new granulations are forming, and these should not be ruthlessly broken up either by instrumentation or by the injection of the biflouride into them. If at the end of two or three months' treatment any of the pockets of infection have not entirely healed, they should be re-explored with scalers and the treatment repeated as for a new case. Teeth that have lost more than half of their gum attachment under this treatment have become firm and comfortable to the action of normal mastication.

Bacterin Treatment. It is doubtless true that in many cases of pyorrhea alveolaris the elimination of the original offenders, aided by proper operative procedures, will enable the tissues to overcome the invading micro-organisms present and once more to establish normal relations. The use of amebicides and bactericides aided by proper operative procedures cannot be depended upon, however, to cure all cases of pyorrhea alveolaris and to prevent re-infection. The bacterial infection remains to be considered. This infection may have

become systemic, as already stated, indicating the use of systemic treatment. The systemic condition may in certain cases be overcome by the use of bacterins. The objects of the bacterin treatment are to aid nature in eliminating disease-producing bacteria from the tissues after they have become established, and also to prevent disease-producing germs from gaining a foothold in the body.

A bacterin for the treatment of pyorrhea alveolaris should contain all the organisms isolated in the given case. Therefore, theoretically an autogenous vaccine should be employed. However, practically a polyvalent stock vaccine will often be found perfectly satisfactory, and thus save the patient the expense and time of an autogenous vaccine.

When the almost universal presence of pyorrhea alveolaris is taken into consideration, and the danger of systemic infection is taken into account it becomes at once apparent that the medical and dental professions should co-operate in their efforts to get rid of the septic mouth and its sequelæ. A septic condition of the mouth may continue for many years without causing any notable systemic infection, but there is always a liability of an extension of the infection to the tonsils from which it is believed the invading organisms may find their way into the blood and be carried to other parts of the body to establish local foci. An important paper relating to tonsillar infection was presented to the Philadelphia Pathogenic Society in the early part of October, 1914, by Smith, Middleton and Barrett, and published in the *Journal of the A.M.A.*, November, 1914. In this paper the authors announced their discovery of the ameba in the tonsils observed in cases of hypertrophic tonsilitis previously observed by Barrett and Smith in infected mouth tissues. Emphasis was given in this paper to the probable relationship between amebic infection occurring in the mouth and tonsils with various systemic complications, such as arthritis, obscure anemics and gastro-intestinal diseases.

E. C. Rosenow has demonstrated the connection between septic tonsils and so-called infectious rheumatism, endocarditis and ulcer of the stomach. Other authorities have pointed out the connection between tonsilitis and appendicitis, and have also proved beyond doubt the connection of various diseases of the viscera content in the abdomen and pelvis with localized foci occurring in the tonsils and the appendix or elsewhere.

These findings give to the dental profession added dignity and importance and make it all the more necessary to include in the dental curriculum a more general knowledge of pathology, bacteriology and general therapeutics.

Attention has been called to the fact that the septic mouth may contain staphylococcus, streptococcus, pneumococcus, influenza bacillus and the diphtheroid group, any one or more of which may be

pathogenic. Further study of the subject demonstrates the fact that the same micro-organisms may be found in the nasal passages and sinuses, and that pathological conditions may result from their presence if any one or more of them become parasites.

The limits of this paper will not permit of an extended reference to the infectious diseases amenable to bacterins and serum treatment. However, when it is considered that abscesses, boils, carbuncles and sycosis, seborrhea, acne, eczema, endocarditis, pleurisy, peritonitis, meningitis, typhoid fever, tuberculosis, diphtheria, cholera, plague and other infectious diseases are either being prevented or successfully treated by the use of these products, their importance as prophylactic and therapeutic agents can hardly be overestimated.—*The Dental Summary*.

[ORAL HEALTH is indebted to the author, Dr. F. E. Stewart, for the loan of four electros used in illustrating this article.]

THE JUSTIFICATION OF HOLLOW INLAYS.—There are four very good reasons why the internal part of the wax pattern for a cast gold inlay should be cupped out: (1) In vital teeth, to allow for a considerable thickness of cement as an insulation between the inlay and that part of the cavity directly over the pulp; (2) by diminishing the bulk of metal, the shrinkage is reduced; (3) by forming a retention box in the inlay, added retention is insured; (4) material is saved which otherwise is needlessly wasted. A very convenient method of hollowing out the wax pattern is to hold it by the sprue wire, and with a sharp rose bur of medium size in the engine to bur away the superfluous wax. If Taggart's wax is used, it may be burred out so that light may be seen through it, and still the inlay be sufficiently thick. This method is also applicable to the cutting out of the inner portion of the wax when cups are cast on shell crowns, thus securing an even thickness over the entire occlusal surface.—*E. L. Hering, Practical Dental Journal*.

A Patriotic Dentist

A PATRIOTIC Belgian dentist had a disconcerting experience. A German officer afflicted with toothache came to him for treatment, and the sight of the suffering Hun appealed to the patriotic instincts of the dentist, who pleaded that he had no time for consultation. Shortly afterwards he received an official message ordering him to be in his consulting room at seven o'clock. Promptly on the hour the victim of toothache and two other officers appeared. The patient took the dental chair, and his comrades, drawing their revolvers, threatened the unfortunate dentist with instant death if he inflicted unnecessary pain.—*London Daily Mail*.

MULTUM IN PARVO

This Department is Edited by

C. A. KENNEDY, D.D.S., 2 College Street, Toronto

HELPFUL PRACTICAL SUGGESTIONS FOR PUBLICATION, SENT IN BY MEMBERS OF THE PROFESSION, WILL BE APPRECIATED BY THIS DEPARTMENT

TO CLEAN IMPRESSION TRAYS.—An easy method of removing modelling compound which has adhered to the tray after the impression has been removed, is by melting a small portion of dental wax in the tray and then wiping out with a cloth. This will leave the tray clean and bright.

ANATOMICAL ARTICULATION.—Much is being written and illustrated with all sorts of diagrams, showing how the jaw moves, etc., which is all right so far as it applies to the natural teeth; but practically in relation to artificial dentures, especially in cases of flat lower jaws, is of no import whatever. The fact that it is impossible to masticate tough meat except in favorable conditions is owing to the impracticability of grinding. The movement is up and down, and there you are. I have often wondered how many of these serious advocates of anatomical articulation are wearing full sets of artificial dentures, especially with flat lower jaws, and also with flat upper jaws where there is nothing to prevent the sliding of the plates in the attempt to grind. Science is all right in theory, but cannot always be applied practically. If you do not believe it, try it in your own mouth—like myself.—*Dental Review*.

TO REMOVE RUST FROM STEEL.—Steel which has been rusted can be cleaned by brushing with a paste compound of half-ounce potassium cyanide, half-ounce castile soap, one ounce whiting, and water sufficient to form a paste. Afterward the steel should be washed with a solution of half-ounce of potassium cyanide in two ounces of water. The cyanide is one of the deadliest of poisons and should be handled accordingly.—*Exchange*.

CELLULOID MATRIX.—Lock the strip together by cutting on opposite sides, then heat small, serrated flat-nose pliers and fuse the celluloid by pinching with the heated pliers. The celluloid in kodak films is suitable for this work when the coating is removed; to remove the coating wash in hot water.—*E. T. Evans*.

AN IDEAL ROOT FILLING should be germicidal, penetrating, non-irritating, non-contracting, impermeable to anything in the oral cavity. Gutta-percha, combined with wood creosote and oil of cassia, makes an antiseptic and ideal filling.

A HANDY MATRIX FOR LARGE FILLING RESTORATIONS.—One of the most satisfactory matrixes for use in those cases in which it is necessary to embrace the whole tooth, especially where the cavity extends below the gingival margin to any extent, is the ordinary anchor clamp band used in orthodontia work. After removing the tube for carrying the bar the band can be quickly and easily adjusted to the tooth and screwed up. This is a much more satisfactory method than using the usual hand-made matrix, and has the great advantage of the operator's being able to use the band again and again for this purpose.—*W. S. Wilkinson.*

DIETETIC TREATMENT OF CHILDREN IN RICKETTS.—If a breast-fed child presents any of the symptoms of rhachitis, the milk of the mother should at once be sent to a laboratory of clinical pathology and be examined for its quantitative and qualitative properties, and if it is found to be deficient in any one of the normal properties which mother's milk contains, the breast milk should be withdrawn and so modified that the deficiency is added; or, if possible, a wet nurse should be employed. If, on the other hand, it is found that the conditions are such that one cannot correct the error in the milk, and a wet nurse is not to be had, the next step is to employ modified cow's milk. In addition to the cow's milk, the child should receive barley water, oatmeal water, and later a small amount of fruit juices. If the child is not suckling, it should be given rice, cream of wheat, farina, and fresh vegetables, which are thoroughly cooked. Vegetables not to be given are cabbage and turnips, for those two vegetables are very hard to digest, as they are rich in sulphides. The juices of fresh fruits are also very good, as is good cream and butter. If the child is old enough to digest the proteids, it should be given good fresh country eggs, fish, chicken and small amounts of rare beef.—*International Journal of Orthodontia.*

CASTING ON PIN TEETH.—Before casting on the backs of pin teeth, the invested tooth should be immersed in water, and wax boiled off instead of burned. This leaves no carbon behind, and platinum does not become brittle and disintegrated. By this method facings are much stronger.—*The Commonwealth Dental Review.*

SILVER NITRATE AS HEMOSTATIC.—In cases of irritating hemorrhage at the gum margins in filling cavities which are close to the margin, a light touch with silver nitrate crystals will make a comfortable field for working. It is also useful in stopping persistent capillary hemorrhage after extraction.

CARE OF HANDS IN LABORATORY.—Before opening vulcanizer, or working in plaster, or with flasks, if you will wash hands in soft water with good soap, and while still moist, pour on and rub in olive oil, you will find when you are ready to cleanse the hands that the stains have not penetrated the skin.—*J. M. H. (Dental Review).*

ORAL HEALTH

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TORONTO, APRIL, 1917

No. 4

EDITORIAL

The Ontario Dental Society Post-Graduate Course

THE one great topic of interest just now among the dentists of Ontario is the coming post-graduate course to be given in May next. It no doubt will prove to be a great uplift, professionally and otherwise, to the many hundreds who propose to be present at that gathering.

ORAL HEALTH is much interested in the success of this venture. It is a great step in advance of the ordinary convention plan of former years, and so this second editorial is written for the express purpose of impressing on every dentist in Ontario the importance of spending the whole week of May 21-26 in the city of Toronto, and sitting at the feet of the most prominent dental teachers on this continent. A look at these men and what they stand for in dentistry will be quite sufficient to make everyone decide he cannot afford to miss such a rare opportunity.

Dr. C. N. Johnson, of Chicago, will take "Operative Dentistry and Management of Practice"; Dr. Forest H. Orton, of St. Paul, Minn., "Crown and Bridgework"; Dr. M. L. Rhein, of New York, "Root Canal Treatment and Filling"; Dr. Arthur Hopewell-Smith, Phila-

delphia, will take "Pathology," and Dr. W. E. Cummer, Toronto, "Partial Dentures and Removable Bridgework."

Keep these names and subjects before you on your desk and talk about them to yourself and to your patients, and tell your friends you are going to spend one whole week in May listening to what will doubtless be the last word on these subjects.

The committee is putting forth strenuous efforts to make the whole meeting an unqualified success, and they are not forgetting the fact that our National Holiday, the twenty-fourth of May, comes in that week. Every member in attendance at the meeting will be the special guest of the committee for that day. It is proposed to make Victoria Day the most important day of the whole week. The morning session will be taken by Dr. C. N. Johnson and Dr. W. E. Cummer. The members are to be entertained at luncheon at the Carls-Rite Hotel and afterwards listen to an address by a prominent speaker. In the afternoon a block of seats will be reserved for members at the Woodbine races and at the International Baseball League games. Also those who wish to play golf will be specially taken care of. It ought to prove a bumper 24th to everyone.

ORAL HEALTH is anxious that every practising dentist in Ontario should benefit by this unique course of lectures, and would advise, and even urge, you to spend the week of May 21-26 in Toronto as a member of this post-graduate course. It will certainly help you to more intelligently and more efficiently serve your patients. That aim should be the sum total of every dentist's ambition.

Cultivate City Lots as a War Measure

DR. Bennett, President of the Ontario Horticultural Society, recently appeared before the St. Thomas Board of Education and secured the appointment of a committee to work in conjunction with representatives of the city council and Horticultural Society, in arranging a city-wide cultivation of vacant lots, as a war measure, for the purpose of increasing the production of food. Dr. Bennett urged the matter from the standpoint of patriotism, and said he was in receipt of a communication from Premier Hearst regarding the work of assisting the people of St. Thomas in conjunction with other Ontario cities, to make use of back yards, vacant lots, etc., to relieve the farmers of the growing of vegetables, so that they will be left free for the growing of grains.

Work of this character is real public service that dentists may well interest themselves in.

Dental Operations

THE following table shows the work performed by officers of the Canadian Army Dental Corps in England and Overseas from October 1 to December 31, 1916, and also showing the grand total of work completed since July 25, 1915. This report is direct from Headquarters of C.A.D.C., Argyll House, 246 Regent Street, London W., and is under date of January 22, 1917:

	Fills.	Treats.	Dents.	Prophy.	Ext.	Devit.	Total.
Total operations reported to Sept. 30, 1916	176,246	36,356	25,747	20,333	150,603	21,568	431,085
October	17,651	4,339	3,331	1,217	17,464	1,706	45,708
November	17,774	4,906	3,442	1,491	26,884	1,760	56,257
December	16,828	4,480	3,503	1,348	15,328	1,491	42,978
Total	228,499	50,081	36,023	24,389	210,279	26,525	576,028

NOTE.—Reports from a number of officers overseas have not been received. It is estimated these would increase the total some 25,000 operations.

J. ALEX. ARMSTRONG, Lt.-Col.,
Director of Dental Services, Canadian Contingents.

The Wounded at Jutland Bank

THE naval surgeons endorse Sir Almroth Wright's methods of treating septic wounds. They say: "When once sepsis has gained a footing continuous saline irrigation seems to meet the requirements, does away with painful dressings, and is particularly non-irritating to the injured and exposed periosteum, which is so easily destroyed by the application of antiseptics." These remarks have an obvious bearing upon the treatment of jaw wounds, but we believe that the saline treatment has a use in early cases of gingivitis and pyorrhoea which has not yet been fully utilized. The frequent use of saline solutions for spraying the gums and interproximal spaces in early cases of peridontal disease will often effect more good than the use of some of the antiseptic solutions which are commonly employed.—*British Dental Journal*.

German Dentists and the War

ABOUT 1,400 German dentists have been summoned for war service up to October, 1915. Of this number, 900 are among the first line troops serving as soldiers or officers. About 500 are doing dental or medical duty in hospitals, and of these again more than 300 are assigned to field and base hospitals, while some 180 are giving dental service in their home cities. Up to October, 1914, 130 dentists had been killed in action, while considerably more than 80 were wounded, and 11 made prisoners.—*Oesterreichisch-Ungarische Vierteljahrsschrift für Zahnheilkunde (Dental Cosmos)*.

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BETTER HEALTH



C. R. ANDERSON, M.A., TORONTO

The dental profession generally will be glad to learn that Mr. Anderson has recently been appointed Associate Professor of Physics, Royal College of Dental Surgeons of Ontario. There are many problems in dental physics that are yet unsolved, and it will be of incalculable benefit to the dental profession that the R.C.D.S. will have a man of Mr. Anderson's training and experience available to the profession for advice and counsel. Mr. Anderson graduated from the University of Toronto in 1893, and afterwards occupied High School positions in Gananoque and Windsor. Subsequently he attended Chicago University, and in 1899, having returned to Toronto, secured the degree of M.A. (Tor.) and was engaged on the staff of the University of Toronto until 1903. Later Mr. Anderson attended a course at Harvard University and received the degree of A.M. from that University. He has had charge of the Department of Engineering Physics at Toronto since the inception of the Department in 1914.

The dental profession welcomes Mr. Anderson to the ranks of those who are endeavoring to bring the best thought of modern science to the solution of dental problems.

ORAL HEALTH

A JOURNAL THAT STANDS FOR THE "OUNCE OF
PREVENTION," AS WELL AS THE "POUND OF CURE"

VOL. 7

TORONTO, MAY 1917

No. 5

Symposium—Interstitial Gingivitis and Pyorrhoea Alveolaris

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With Abstract of Discussion by

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CHICAGO; DR. RUSSELL W. BUNTING, ANN ARBOR;
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*Being a series of short papers read before the Section on
Stomatology at the sixty-seventh annual session of the
American Medical Association, and published in ORAL
HEALTH by courtesy of the Journal of the A.M.A.*

BACTERIAL FINDINGS AND THEIR RELATIONSHIP TO PYORRHOEA ALVEOLARIS AND INTERSTITIAL GINGIVITIS.

A. W. Lescohier, M.D., Detroit.

FEW subjects in medical history have given rise to more frequent controversies than the inflammatory diseases of the gums. The classification, nomenclature, pathology, even the anatomy of the parts involved have afforded material for protracted argument. Probably no phase of the subject has been more keenly discussed than the etiology, and during recent years much of this interest has centred on the part played by bacterial invaders.

The probable relationship of pathogenic bacteria to the development of pyorrhoea has been recognized for several decades. Malla-

sez and Galippe (1) (1884), Black (2) (1887), Miller (3) (1889) and Kirk (4) (1898) were some of the early investigators of its bacteriology. A variety of organisms were described, none of which could be specifically associated as the causative factor. Probably the first to ascribe etiologic significance to any particular micro-organism was Arkovy (5) (1904), who attributed acute cases of alveolar suppuration to streptococcic infection.

A detailed review of the voluminous literature on the bacteriology of pyorrhoea and allied conditions appears neither necessary nor desirable. Many of the reports were based on studies, the scope of which was limited both by the paucity of cases under observation and the facilities and training for their intelligent investigation. It seems advisable rather to try to correlate the facts established by those investigators who have definitely contributed to the bacteriology of the disease.

Perhaps the most notable of the early studies on the relationship of micro-organisms to the pathology of pyorrhoeal diseases is that of Goadby (6). His first report in 1907 described a variety of organisms occurring in connection with pyorrhoea, to none of which it was possible to attribute a definite etiologic relationship. This group of organisms included, in addition to the pyogenic cocci, various types of bacilli and spirilli. Curiously enough, in view of later developments and the fact that a study of his protocols shows that streptococci and staphylococci were found much more frequently, Goadby appeared to attach considerable importance to the bacillary forms. In 1908 Goadby reported the successful treatment of two acute cases of pyorrhoea alveolaris with autogenous vaccines; in one of these the infection was mixed streptococcus and *Staphylococcus albus*, and

TABLE 1.—ORGANISM FINDINGS IN SEVENTY CASES OF PYORRHOEA ALVEOLARIS.

Organisms—	No. Cases Present.
Streptococcus	19
Pneumococcus	5
B. necrosis-dentalis	14
M. catarrhalis	23
B. septus	15
Staphylococcus aureus	12
Saccharomyces	5
Micrococcus citreus-granulosis	6

in the other streptococcus was present almost in pure culture. In 1909-1910 a supplementary study of seventy cases was reported, in which the findings are given in Table I.

During the period from 1907 to 1912 articles dealing with the bacteriology of pyorrhoea were contributed by numerous workers, among whom may be mentioned Carmalt-Jones and Humphrey (7),

-
- (1) Mallasez and Galippe: Compt. rend. Soc. de biol., 1884.
 (2) Black: Indep. Pract., New York, August, 1887.
 (3) Miller: Mikroorganismen Mundhoble, Leipzig, 1889.
 (4) Kirk: Dental Cosmos, 1898.
 (5) Arkovy: Brit. Med. Journ., 1904, 2, 1371.

Sims (8), Eyre and Payne (9), Fletcher (10), Beebe (11), Best (12), Williams (13), Logan (14), and Leary (15). The results of their investigations were diverse and do not materially assist in clearing up the confusion existing relative to the bacteriology of the disease. The only deduction which they justify is that a number of micro-organisms, potentially pathogenic, may, under certain conditions, be isolated from suppurative lesions of the gums.

The possibility of spirochetes being concerned pathologically in pyorrhoea has received some attention. Various workers, including Noguchi, have described spirochetal types found in the oral cavity, and in 1912 Noguchi (16) isolated, in pure culture, from a case of pyorrhoea a mucin producing spirochete which he named *Treponema mucosum*. This organism is not regarded by Noguchi as strictly parasitic, but he ascribed to it pyogenous action under conditions in which the tissues have been so injured as to enable it to survive. The strong fetid odor in some cases of pyorrhoea he believes to be due, in part at least, to the presence of *T. mucosum*.

Recent bacterial studies, which seem to be entitled to careful consideration, are those reported by Medalia (17), Brown (18), and Hartzell (19).

Medalia's reports were based on a study of 115 cases, in which a careful bacteriologic investigation appears to have been carried out.

TABLE 2.—BACTERIAL FINDINGS BY MEDALIA IN 115 CASES OF PYORRHOEA ALVEOLARIS.

	No. Cases with Organisms.	Per Cent.
Incipient Cases (14)		
Pneumococcus and Staphylococcus	10	71
Pneumococcus	2	14
Staphylococcus and streptococcus	1	7
Sterile	1	7
Moderately Advanced Cases (16)		
Pneumococcus and staphylococcus	8	50
Pneumococcus	6	37
Staphylococcus	1	6
Sterile	1	6
Far Advanced Cases (85)		
Pneumococcus and staphylococcus	49	57
Pneumococcus	18	21
Staphylococcus	1	1+
Pneumococcus and streptococcus	3	3+
Pneumococcus, streptococcus & staphylococcus ..	10	12
Pneumococcus and Micrococcus catarrhalis ..	1	1+
Staphylococcus and Micrococcus catarrhalis ..	2	2+
Sterile	1	1+

(6) Goadby: Brit. Med. Journ., Sept. 9, 1905; Tr. Odontological Soc., March 1906; Lancet, London, March 9, 1907; Brit. Med. Journ., Aug. 22, 1908; Lancet, London, Dec. 25, 1909; Practitioner, London, 1912, **88**, 107.

(7) Carmalt-Jones and Humphrey: Lancet, London, Dec. 28, 1907.

(8) Sims: Dental Practitioner, Toronto, October, 1908.

(9) Eyre and Payne: Proc. Roy. Soc. Med., Odontological Section, Nov. 22, 1909.

(10) Fletcher, M. H.: Unclean Mouth and Its Evil Results, The Journal A.M.A., July 13, 1912, p. 91.

(11) Beebe: Boston Med. and Surg. Jour., Oct. 28, 1909.

(12) Best: Dublin Jour. Med. Sc., **133**, 91.

(13) Williams: Am. Jour. Med. Sc., 1911, **112**, 666.

(14) Logan: Dental Rev., 1911, **25**, 649.

(15) Leary: Dental Cosmos, 1909, p. 55.

The series included fourteen incipient, sixteen moderately advanced, and eighty-five advanced cases. The findings reported are as given in Table 2.

We would be led to infer from these results that the pneumococcus is the most important organism to be considered, as it was found either alone or in combination in 107 of the 115 cases (93 per cent.), and the streptococcus only an occasional invader, as it was reported as being present in only fourteen cases (12 per cent.). The work of other investigators does not, however, substantiate this deduction. Brown, in forty-eight cases, observed *Streptococcus viridans* twenty-three times, hemolytic streptococci thirty times, and nonhemolytic streptococci twenty-eight times. Pneumococci were present in twenty-seven cases, staphylococci, diphtheroids and organisms of the *Bacterium influenzae* group being also frequently found.

Hartzell's work, perhaps the most convincing of any that has been reported, points strongly to the importance of the streptococcus in pyorrhoea. His observations have indicated that approximately three-fourths of the bacterial content of pyorrhoea pus pockets is made up of pyogenic cocci of the *Streptococcus viridans*, and staphylococcus types, and the remaining one-fourth of other organisms. Hartzell's animal inoculations have shown that following the intravenous injection of pus from pyorrhoea pockets streptococci of the viridans type are usually recovered, occasionally staphylococci.

Personal observations relative to the occurrence of streptococci, staphylococci and pneumococci in pyorrhoea would place streptococci first in frequency, staphylococcus next, pneumococci being observed in only a small percentage of cases.

The scope of this paper does not extend to a consideration of the relationship existing between pyorrhoea and systemic diseases. The importance of oral infection in metastatic infections of the heart, blood vessels, joints, kidneys and other tissues is, however, generally recognized. Hartzell has emphasized the fact that of the organisms found in the mouth, there are none having the varied possibilities for disease production characteristic of the streptococcus group. Clinical observations, as well as the results of animal inoculations, have clearly shown that in the remote pathologic effects of oral infection, the streptococcus overshadows in importance all other organisms which may be present in pyorrhoea pockets.

A discussion of the causative factors in pyorrhoea necessarily involves a consideration also of its pathology. Considering interstitial gingivitis and pyorrhoea alveolaris as phases of the same disease, we generally recognize that bacterial invasion is characteristic of the pus

(16) Noguchi: Jour. Exper. Med., 1912, 16, 194.

(17) Medalia: Boston Med. and Surg. Jour., 1912, 167, 868, 922; Dental Cosmos, January-February, 1913.

(18) Brown: New York Med. Jour., 1915, 98, 1201.

(19) Hartzell: St. Paul Med. Jour., 1916, 18, 77; Report First District Dental Society of the State of New York, Jour. Allied Dental Societies, March, 1916.

stage, and is not necessarily present in cases of interstitial inflammation without pus. The bacterial studies which have been reported are based largely on investigation of cases of the purulent type. The occurrence of gingival inflammation, without infection, as the result of trauma, irritation and constitutional influences during the non-purulent inflammatory stage of the disease is scarcely open to question. On the other hand, the conclusion of some investigators that bacterial invasion in pyorrhoea is invariably a secondary factor, infection being universally absent prior to the pustular stage of the disease, does not seem to be established. An infected zone around the root of the tooth, usually due to acute streptococci infection, may exist. It would be strange indeed if this were not so, since the poorly protected gingival crevice offers a splendid opportunity for bacterial attack, the microbic penetration being aided by the formation of calculi on the roots of the teeth or at the gingival margin and the number of the infecting organisms being augmented by the neglect of oral hygienic measures.

The tendency to consider any etiologic factor in pyorrhoea as an entity instead of in relationship to other influences is unfortunate. Irritation, trauma, metabolic disturbances and microbic invasion constitute a vicious circle in the development of alveolar diseases. The bacterial element is probably the most important element in the destructive tissue changes and certainly so in the serious sequelae. While it is impossible definitely to classify interstitial gingivitis or even pyorrhoea as primarily a microbic disease, the pathology is intimately associated with the results of bacterial invasion and the adequate consideration of its treatment must necessarily recognize the importance of the infectious element.

THE ROENTGEN RAY IN THE DIAGNOSIS OF PYORRHOEA.

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ROENTGENOGRAPHY for the demonstration of pyorrhoea alveolaris does not differ in its technical plan from that used in other procedures intended to shed light on diseases located in the jaw bones. The constant feature of the disease which makes its demonstration by roentgenoscopy possible is the ulceration of the presenting margins of the alveolar process and the more intimate bone about the roots. In general the extent to which this marginal bone is found to be eroded is the measure of the extent of the disease recorded on Roentgen-ray films or plates. The relative simplicity of a Roentgen-ray procedure, which is required to show only the height or depth of a bone profile in so thin an object as the human jaw, is quite apparent, and in reality no such rigid technic is necessary in pyorrhoea as in the demonstration of periapical disease, in which a focus of minor decalcification must be detected in and surrounded by a considerable mass of bone of variable and often complex structure.

This rough delineation of the general present depth of the process with respect to the dental roots in a case of known pyorrhoea is therefore a relatively simple problem, and in itself is scarcely deserving of a lengthy dissertation. But in any series of pyorrhoea cases the general roentgenographic survey is capable of bringing to light some of the minor changes about the roots of individual teeth, such as the localized or beginning extension of the disease toward a given apex, the softening of the adjacent alveolar wall due to an early inflammation of a single peridental membrane—the signs, in short, of the early and deeper encroachments of the disease which are so important in the complete diagnosis and prognosis of a pyorrhoea case. For the detection of these minor but most important changes in the bony investments of the teeth only the most critical roentgenography is of value, and this must be combined with a careful and intelligent reading.

In roentgenograms of the normal denture, the spongy bone of the jaw uniformly envelops the dental roots and proceeds fully up to the point of attachment of the peridental membrane. In the most critical roentgenograms, the shadow of this spongy bone is seen through the shadow of the dental root, but is most prominently visible in the septal bone. The septal bone is characteristically of triangular shape, with more compact bone at the marginal apex, and at this apex one often sees an apparent fusion of the white line surrounding the adjacent roots. This so-called white line is the shadow cast by the denser walls of the alveolus between which and the roots themselves is the slight space occupied by the peridental membrane.

It is well known dental pathology that in pyorrhoea the primary site of bone liquefaction is in that bone immediately adjacent to the peridental membrane. For this reason it is so often seen in roentgenograms that the marginal line of persistent bone is wavy with the deepest erosions in juxtaposition with the teeth. Whenever in roentgenograms it is seen that a localized or deeper absorption has occurred, it must be admitted that no correct inference can be made as to whether this erosion lies primarily on the labial, buccal or lingual aspect of the process. There is seldom seen in the most critical roentgenograms a double marginal line which could be known to represent, respectively, the inner and outer limits of erosion, and even where the double line is seen, it is impossible to distinguish the inner from the outer. Moreover, the film method calls for the projection of the light at such angles that, while the teeth show with minimum distortion, there is a palpable displacement on the film of the position for attachment of the peridental membrane externally with respect to its internal attachment. Should, therefore, the double line be visible in every case, a correct interpretation would involve a reasonable discount for angular displacement. For this reason, the most accurate and comprehensive portrayal of the exact position and

the extent of the erosion is often obtained by the stereoscopic method, in which the stereoscopic shift is made along a vertical line rather than along the usual horizontal line, for reasons apparent to those versed in stereoscopic roentgenography in general. To obtain the most valuable average line as a gross measure of the ulcerative process, roentgenograms may be made at a considerably lower angle than for demonstration of the apexes, although an elongation of the dental shadows themselves will result.

Whether or not the general line limiting the ulcerative process can be followed across the shadows of the roots themselves, it will usually show plainly in the region of the septal bone. Wherever the teeth are normally spaced and the septal bone abundant, the marginal dissolution at the interspaces is very plain. In case the teeth are closely crowded and the septal bone small in amount, or when for any cause the ray angle used in the exposure was such that a lateral overlapping of dental shadows has resulted, the depth of septal bone is indeterminate. Inasmuch as the septal bone erosion is usually less than that in the immediate vicinity of the peridental membrane, the amount of septal destruction is not to be taken as the true limit of the encroachments of the disease on the jaw. Rather, this must be based on a careful observation of the integrity of the bone enveloping the peridental membrane farther toward the apex. Often a lateral or circumferential absorption can be followed deeply toward the apex. This appearance denotes a localized pyorrhoea pocket, and is often concentrically funnel-shaped. In conjunction with this funnel-shaped dissolution, which extends around the tooth to a greater or less depth beyond the line of septal erosion, is often seen a more delicate partial decalcification of the white line extending to and around the apex, together with a slight widening of the space occupied by the peridental membrane itself. This finding is the premonitory sign of the inflammation of peridental membrane which precedes extension of the funnel-shaped pocket to and around the apex. It is now only a matter of a short time till the entire depths of the root are surrounded by the liquefied products of the ulcerative pericementitis.

The limitations in the value of the Roentgen findings in any disease should also be mentioned. While the Roentgen findings in pyorrhoea as a rule agree very well with findings elicited by a digital or instrumental examination, and are obtained with far less discomfort to the patient, there are certain respects in which they are disappointing. Let me mention a few of these: Sometimes a pyorrhoea tooth is quite loose, and a well defined pocket is expected in the roentgenogram. Instead, it may require a stretch of the imagination to find in the roentgenogram more than a simple loss of the normal white line. This is undoubtedly because the atrophy which has occurred is diffuse and poorly demarcated. Again the tooth shows

no looseness on examination, and the roentgenogram shows the deepest kind of a pocket. This apparent discrepancy is undoubtedly due to the escape from the disease of a limited portion of the investing structures, not recognized roentgenographically, but sufficient in amount to maintain the stability of the tooth for the time being. A very important point in the diagnosis may be entirely undemonstrable by Roentgen methods, and I refer to the activity of the disease at the time of examination. Quite frequently roentgenograms are essentially similar in cases in which gross amounts of infective material can be expressed from the jaw to those in which the disease in all its clinical manifestations is entirely quiescent or advancing at a very slow rate. It may be sufficient to mention the general roentgenographic fact that in an ulcerative process in which bone shadows show partial or poorly limited decalcification, the process is in an active or rapidly progressive stage, whereas in well demarcated cases, in which areas of complete liquefaction lie directly adjacent to areas of undisturbed bone, the process may be considered more chronic in type.

Conclusions.—A general survey of the denture by a series of dental films is an important adjunct to the examination of a pyorrhoea case. It is often a short cut to diagnosis and is less disagreeable than an instrumental examination, but should supplement rather than displace other diagnostic methods. The most important diagnostic points are observable in the region of the intimate bony investments of the roots and are obtainable only from the most critical roentgenograms.

122 South Michigan Avenue.

THE IMPORTANCE OF A CORRECT DIFFERENTIAL DIAGNOSIS OF
THE PREDISPOSING CAUSES IN CASES OF INTERSTITIAL
GINGIVITIS OR PYORRHOEA ALVEOLARIS.

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PERIODICALLY, we are told that interstitial gingivitis, or pyorrhoea alveolaris, is caused by some special organism which the writer has just discovered. Specific investigation and attempts to corroborate these vaunted discoveries have always proved them to be erroneous. We are just beginning to recover from the shock of how little we know about the *Endameba buccalis*. The fact that a prominent research worker in medicine proclaimed to the world that the endameba was responsible for every case of pyorrhoea, and that this disease was present in 95 per cent. of our population has been the direct cause of much confusion. Physicians lacking education in mouth physiology and pathology were especially imposed on by this dogmatic assertion.

Research work which I have conducted in the mouths of animals has corroborated the work of general observers to the effect that infection is impossible in an individual otherwise physically well. Considering, as we are, end-organ tissue, it must be admitted that unless prophylactic measures have been adopted, the so-called dental organs are the first to exhibit a diminution in immunity to infection, if any form of malnutrition is in evidence. If, by exercise, massage and other hygienic measures, the circulation in the ultimate capillaries is kept moving, the gums and peridental tissue will frequently retain their immunity, even though malnutrition is present.

Pyorrhoea alveolaris is a result of malnutrition plus infection, and also most frequently plus irritation, and it is greatly intensified if arteriosclerosis of the ultimate capillaries sets in. Only daily observation of the dental tissues can make one familiar with the appearance of a normal mouth, and without this knowledge, it appears impossible for any one to differentiate the different appearances of these tissues in different diseases.

While all forms of pyorrhoea must commence with some form of gingivitis, yet the tissues in this and all succeeding stages vary in clinical appearance as markedly as do the generic types of malnutrition which interfere with a proper equilibrium of the circulation. The blue line in the gums as a result of mercurial toxemia, and the mucous patches due to syphilis, are old landmarks in medical diagnosis. In like manner the physician awaits the eruptive stage in order to make a correct diagnosis as between smallpox and measles, or any of the other exanthems. It may, therefore, be asserted with assurance that the variations in clinical appearance of the gums and pericemental tissues point with unerring fidelity to the cause of the dyscrasia. When these are once read with the same assurance with which we now read the blue line, a great advance in the diagnosis of this disease will have been reached. When it is once duly appreciated that pyorrhoeal symptoms are a possibility at the very onset of any interference with the normal action of any vital function, and that a proper reading of their clinical appearance will disclose at once the nature of the trouble, the study of the dental organs will be properly comprehensible, and not until then.

The fact that pyorrhoeal manifestations are very frequently observed, without the investigator being able to obtain any confirmatory diagnosis of some form of malnutrition, is generally due to the fact that impairment of the vital organs progresses very slowly, and that frequently with our present day methods it is impossible to make a correct diagnosis until the disease has reached an advanced stage.

When, finally, as the organic disease increases, a correct diagnosis is made, it is not uncommon to find that this organic disease is believed to be caused by the pyorrhoea. The poor diagnostic sense of the uninformed dentist is the cause of this frequent error in diagnosis,

this placing of the cart before the horse. While an abnormality of some important organ or organs of the body is generally the predisposing cause, we see other types of pyorrhoea where the predisposing cause is the decrease in functional power of the teeth themselves. Here loss of teeth by extraction, irritation under the gingivae from unpolished fillings, and every type of malocclusion become the predisposing causes instead of their being caused by some organic disease.

Every dentist will corroborate the great variation in the mouth picture which presents itself in different pyorrhoeal cases. We see the case without any deposit on the root in strong contrast with those in which these deposits seem to overwhelm all the exposed root structure. We see the gum abnormally dry and parched in contrast to those cases in which the mucous follicles are constantly excreting varying quantities of fluids. There is the pale anæmic gum in contrast to the ruby red inflamed gum. We find pockets under the gums free from suppuration or exudation, in contrast to those cases in which there are purulent discharges, and the gums are so inflamed and spongy in character as to bleed on the slightest provocation. There are cases in which the gingival border is atrophied to a knife blade edge in contrast to every type of hyper-trophied tissue. The gums at times will be found in all possible shades of color, and in certain cardiac diseases there is a sharp division line between a normal pink and dark blue in the gums in the same mouth.

We find no such variation in symptoms in any infectious disease. Smallpox, tuberculosis, typhoid fever, measles, syphilis, yellow fever, diphtheria, etc., all possess well defined symptoms, which mark them unmistakably as the disease in question.

In interstitial gingivitis or pyorrhoea alveolaris, the clinical appearance is but a reflection of the predisposing cause. Each different picture will always be found associated with one particular predisposing cause. A carefully recorded study of these different pictures will soon make the observant stomatologist familiar with at least some of the more common types of malnutrition, and after a time he can readily recognize them on sight.

It has been my good fortune, because of experience with these clinical pictures, to have frequently been the means of directing the patient in the early stages of some serious ailment in keeping with rational treatment. It is impossible to estimate too highly the value of such a diagnosis being made in an early stage. It is wrong for us to discuss this subject as though we were speaking of some specific disease instead of addressing ourselves to pathologic symptoms of one of many diseases.

The time will come, when the subject is under discussion, that it will be confined to the particular malnutrition causing a given type of pyorrhoea. In 1894, I presented such a method of classification by

prefixing or adding an adjective stating the name of the disease, which is causing the pathologic symptoms in the oral cavity, as "diabetic pyorrhoea," "tuberculous pyorrhoea," etc. Only under such a classification can rational discussion be held on this subject. Take, for example, "nephritic pyorrhoea" and "diabetic pyorrhoea." While renal abnormalities occur in the predisposing cause in each type, nevertheless, the symmptomatology and treatment should be entirely different in each type. When this point is conceded, due importance will thereafter be given to the necessity of making clear the nature of the predisposing cause of the cases under discussion.

It is well understood in general surgery that operative procedure is attended with great danger to life itself in patients suffering from diabetes not under control. Consequently, the same danger to life exists when surgical interference is commenced in pyorrhoea when there is present an active condition of diabetes. The at one time well nigh universal habit of dentists using surgical intervention in diabetics without making any diagnosis of the predisposing cause has produced its quota of fatal consequences. In advanced stages of fatal diseases, it would be unnecessary brutality to subject the patient to the discomforts of surgery. On the other hand, when the disease is curable, it is of great importance that the stomatologist should be given an accurate statement by the internist of every body disturbance, so that all local treatment should proceed in therapeutic harmony with the general treatment.

Prognosis of pyorrhoea or gingivitis must largely depend on the possibility of obtaining a cure of the malnutritional factor. It is for this reason that the results of all physical examination, etc., should be in the hands of the stomatologist, so that he can not only work in harmony with the physician, but also keep accurate record of any tissue changes that may take place.

When the preponderating importance of an accurate diagnosis of the predisposing cause of pyorrhoea is appreciated, an important factor in the maintenance of our point of view is established to the effect that the dentist treating these and all other mouth diseases should be as efficiently educated in general medicine as is the specialist in any other department of medicine.

38 East Sixty-first Street.

SOME STUDIES IN THE TREATMENT OF PYORRHOEA ALVEOLARIS. *George Bailey Harris, D.D.S., Sc.M., Detroit.*

IN the consideration of the treatment of pyorrhoea alveolaris, as with any other disease, we must presuppose a knowledge of the disease. There are, however, so many conditions suggested as being causative factors in pyorrhoea, that it is hardly possible to assume that any one of them is responsible for pyorrhoea, to the exclusion of the rest. Among the conditions which have been ad-

vanced as being causative agents in pyorrhoea might be mentioned syphilis, rheumatism, liver affections and autointoxication. These conditions and any other which will lower the resistance of the tissues must be considered as causative factors in pyorrhoea, and their eradication, wherever possible, must be accomplished when the treatment of pyorrhoea is undertaken.

Pyorrhoea should be looked on as an infectious disease and treated as such. Its inception, then, is based on the resistance of the tissues to bacterial invasion, which must be lowered before the infection can be overcome. This means the building up of the resistive forces throughout the entire body, as it is difficult to perceive how the resistance, under these conditions, can be raised in the gum tissues alone. This must be done not only to throw off the present infection, but also to guard against its recurrence. The lowered resistance to the tissues surrounding the teeth is due, in many cases, to the well known calcium deposits and irritations produced by faulty dental work. These conditions must be corrected.

If, however, we better understood the causes of pyorrhoea and knew more about the tissues most vitally involved in making a repair, we would be able to treat this disease more intelligently, and there would result a greatly increased number of recoveries.

I have been greatly surprised at the wonderful recuperative power of the cementum. The literature relating to this tissue is confined, in the main, to its description and histologic structure, very little being said about its use. Cementum is the bond between the teeth and the bone, the tooth and bone seemingly being unable to form a union themselves. It seems to have about the same recuperative power as bone, and, furthermore, under proper conditions, cementum has the power to regenerate, after it has been cut in grooves or removed entirely from the root, provided a sufficient amount of the cementum is left on the root from which regeneration can take place. If, however, a large portion of the cementum is removed and the remainder then weakened or entirely destroyed by such mild germicides as trichloroacetic or sulphuric acid, we should not expect to have any reformation of the cementum. When this is done, we might just as well take the next step at once and extract the tooth as wait and do the same thing at a later date or let nature throw it off herself.

Some time ago I had occasion to make an upper denture for a woman about 50 years old. She had worn full upper and lower dentures for some twenty years. On examining her mouth I noticed an enlarged and inflamed surface in the region of the second bicuspid. She informed me that it had been giving her trouble for a long time and that she had to have a place cut out of the denture to avoid pressure on it. I opened into it and removed about one-third of the root of the second bicuspid which had been broken off when the tooth was extracted. The one side was flattened, but there were no

sharp edges. A cross-section was made, and when put under the microscope it was found to be completely encased in cementum, the cementum on the flattened surface being nearly a third thicker than the other. A section made near the apex of the root showed a normal condition, with no variation in the thickness of the cementum. When this root was extracted, instead of breaking off at right angles, it split at an angle, and the cementum remaining not only regenerated sufficient tissue to cover that portion of the root that had been stripped of its cementum, but a third more. Dr. Fletcher has recorded a case in which the crown had been broken off in an attempted extraction, and the cementum had not only grown over the dentin, but also had partly filled the canal. In this case, too, the cementum which had grown over the dentin was much thicker than normal. These cases seem to show that we may expect a restoration of tissue to a great extent, if not entirely, provided the conditions governing such a growth are ideal. This means that the new cementum forming must not be removed daily or weekly in the overzealous use of scalers and files, nor must the healthy cementum and paradental membrane be removed. To get something, something must be left. The regeneration of the cementum must be the result of stimulation, brought about by the careful use of the affected teeth, and there must be an active blood supply. This can be encouraged by careful but not too diligent massage, and the absence of astringent mouth washes. The teeth must be cleaned, not merely brushed.

The bacteria commonly found in pyorrhoea are constantly present in the mouth. If oral hygiene is a common practice with the individual, their numbers are greatly lessened; if not, they become very abundant. A person can go for years with ill-fitting crowns and maintain an ideal condition for the development of pyorrhoea. That is resistance; and when it is lowered, pyorrhoea follows quickly. As long as he maintains that resistance, he is immune; but as soon as it is lowered, pyorrhoea overtakes him. In order to recover, that resistance must be returned; otherwise the pyorrhoea will only be kept in check, never cured. To prevent the formation of tartar deposits, after they have been removed, Epsom salt is most proficient. It might be said that constipation plays an important part in the formation of these deposits, and should form a sort of index in cases of chronic constipation.

There are a great many pathologic conditions which have or are supposed to have their origin in mouth infections, of which pyorrhoea is a common and important one; but it must be remembered that there are lots of people with arthritis who are wearing full upper and lower dentures and have been so doing long before they become afflicted with arthritis. There are a great many cases of arthritis that have their foci in the mouth, but these infections are sometimes present in cases of arthritis, the removal of which does not result in

the disappearance of arthritis to any degree. In these cases, therefore, while there may be pyorrhoea and other foci of infections present, and while every effort must be made to eradicate them, we must not devote all energy to these infections to the exclusion of foci in other parts of the body which may be the chief foci, and relief cannot be had until they are located and removed. Further, there are many roentgenograms which show rarefied areas around the apexes of the roots that are rightly interpreted as being foci of infection, but it must also be remembered that there are lots of others which show the same rarefied areas which are not foci of infection, being localities in which there possibly once was a focus but which has been removed, and the tissue not yet completely filled in, which may never completely take place. This is amply proved by using an aspirator and removing a portion of the content of that supposed focus, only to find it to be nearly free from bacteria. Except in extreme cases, therefore, there is no justification for the extraction of a tooth, simply because a roentgenogram showed a rarefied area, unless substantiated by other diagnosis. The extraction of teeth, in an effort to check infections in other parts of the body, just because a roentgenogram showed a rarefied area, except in extreme cases, is to be condemned. If this practice is to be indulged in, it must have its completion in the extraction of all devitalized teeth whether or not the Roentgen ray shows a rarefied area to be present. Also all teeth that are pyorrhoeic would have to be extracted because they are foci of infection, and those that are not yet affected would have to be extracted because they might become foci of infection.

THE ETIOLOGY AND TREATMENT OF INTERSTITIAL GINGIVITIS.

Eugene S. Talbot, M.D., D.D.S., Chicago.

MY researches on interstitial gingivitis and pyorrhea alveolaris (1) were published in book form in 1899. In this work every conceivable phase of the disease was studied on animals as well as man. The pathology was beautifully illustrated from its beginning to the formation of abscess, on the one hand, and exfoliation of the teeth on the other.

The object of this paper is to try to make clear the etiology, pathology and treatment based on the researches laid down in my work.

The tissues about the roots of the tooth may become diseased under extreme local irritation or from constitutional disease, but as a rule the progress of tissue building about the first and second set of teeth prevents tissue degeneration. Not until the bone has obtained its growth, from 27 to 35 years of age, does degeneration take place to any great extent, although marked inflammation of the gums may be present. When the alveolar process has obtained its growth about the second teeth, the bone may be said to have reached the senile stage, and absorption under favorable conditions begins.

The Etiology.—In considering the etiology of interstitial gingivitis, my researches have shown that the tissues surrounding the roots are end-organs, owing partially to the fact that the teeth, so far as nerves and blood vessels are concerned, are foreign bodies, and partly to the end-structure of the bone. An end-organ is a structure in the body in which nerves and arteries extend to the extreme end and then stop. The veins being extremely sluggish, the blood containing poison remains, and, being unable to return, sets up a low form of inflammation. The dental pulp is the best example of an end-organ in the human body. A study of this structure under the microscope, of persons over 40 years of age, will reveal all the degenerative pathologic conditions possible (2).

The blood, then, which flows into the alveolar process, owing to local irritation about the gum margin or root of the tooth, does not return into the circulation. Blood charged with metallic, drug or body poisons collects in the alveolar process and produces irritation. Stasis results (Fig. 58, Interstitial Gingivitis) (1), nutrition is cut off, and a low form of inflammation is produced. Nerve end degeneration takes place, endarteritis obliterans, and arteriosclerosis occurs.

Ziegler (3) says:

"The causes of inflammation may lie either in mechanical, thermal, electrical or chemical influences, as well as in the influence of parasites. The common characteristic of all these injurious agencies is the production, in the first place, of a local tissue degeneration, which, when of a certain extent and intensity, is associated with disturbances of the circulation and of vascular secretion."

This exactly describes the condition found in the alveolar process. Stasis of blood in interstitial gingivitis is, then, due to mechanical irritation and possibly chemical changes in the blood.

Ziegler (3) again says:

"Under the designation inflammation are grouped those pathological processes, consisting on the one hand of tissue degenerations and tissue proliferations, and on the other, pathological exudations from the blood vessels."

In this particular form of inflammation, tissue degeneration takes place. There is no pain, heat or swelling as observed in the other forms of inflammation.

When we consider the peculiar enotransitory nature of the alveolar process, degeneration of tissue is the natural result. At the senile period when the excretory organs are diminishing in activity and in disease, vital resistance is at its lowest ebb, metabolism is diminished, and degeneration and absorption of the alveolar process is in active

(1) Talbot, E. S.: Interstitial Gingivitis or So-Called Pyorrhea Alveolaris, Philadelphia, S. S. White Dental Manufacturing Company, 1899.

(2) Talbot, E. S.: Developmental Pathology, Boston, Richard G. Badger, 1912, chapter on the dental pulp.

(3) Ziegler: General Pathology, p. 311.

operation. As age advances, the destruction of bone is a natural normal pathologic process.

The disturbances in circulation bring about tissue degeneration because the gingival border of bone is very thin, transitory and easily destroyed. The action of this mechanical irritation is to produce artery changes, nerve end degeneration and absorption of bone about the arteries, called haliteresis. Stasis of blood may take place in a circumscribed area, or on the entire border of the alveolar process; or the apical end of one or more roots may be involved. This depends on the nature and quality of the irritant. The nature and severity of the irritation, stasis of blood and a lowered vitality of the patients will also determine the extent of the destruction of tissue, whether the irritation is located at the apical end of the root, midway between the apex and the cervical margin, or at the cervical margin.

When the inflammation has once become established at the cervical margin, the absorption is progressive to a greater or less extent until the tooth or teeth are removed. Owing to the transitory nature of the alveolar process when irritation and stasis of blood occur, the nutrition of the part is interfered with and the bone tissue may be partially or wholly destroyed, leaving the fibrous tissue (trabeculae) undisturbed, thus holding the tooth firmly in position, although it can be moved laterally by the fingers. In most cases, however, the entire structure, including the fibrous tissue, is destroyed.

My researches have shown that the deposits on the roots of the tooth, other than tartar, are the detritus of destroyed bone and not deposits from the blood, as was formerly supposed. The pus stage is an after-consideration, and has nothing to do with the disease.

In summing up the etiology, then, in this disease: 1. We have to contend with the bone as an end-organ in which the blood accumulates (stasis). 2. Stasis of blood cuts off nutrition. 3. Local and constitutional irritation and chemical changes in the blood set up a low form of inflammation and bone absorption. 4. The absorption is enhanced because of the transitory nature of the alveolar process. 5. Nerve end degeneration and arteriosclerosis occur. 6. Want of vital resistance assists absorption.

Local Treatment.—The first symptom of interstitial gingivitis is bleeding of the gums on the slightest injury. The classification of the different phases of the disease renders the treatment, so far as we are capable of directing it, simple and easy.

The first thing that naturally comes to the mind of the operator is to remove the cause. The local treatment may begin immediately. For personal reasons of cleanliness of the patient and the operator, one or two applications of iodine should first be made to the gums, which will destroy the germs and cleanse the mouth. After this has been accomplished, the removal of all local irritation may begin.

We have seen that stasis of blood cuts off nutrition, causing degeneration of tissue (absorption of bone). *The main object to be obtained in the treatment of this disease is to remove the stagnant blood, re-establish the metabolic process and cause a normal flow of fresh blood to nourish the parts.* The nutrition of the part must be renewed that nature may restore the tissues to health.

How shall this be accomplished? To remove congested blood, physicians, from fifty to a hundred years ago, resorted to cupping, leeches and scarifying the tissues. These methods must be resorted to at the present time in treating this disease. If the gums are congested and festoons hang down between the crowns of the teeth, they may be removed on a line with the alveolar border with a lance.

The gums should be allowed to bleed as freely as possible. In removing the deposits from the roots of the teeth, the parts may be injured as much as possible with as little pain to the patient as possible, the germs having first been destroyed. In this way much of the congested blood can be removed.

The suction process, not unlike the old method of cupping, is excellent when properly performed.

Scarifying the gums is also a good method of procedure. Vigorous gum massage with a stiff gum massage brush should now be employed to stimulate the tissues to healthy action.

Before the operation and after bleeding, iodine should frequently be employed to destroy all germs in the mouth. All loose teeth should be removed.

The following preparation has been used since 1878:

Water	10 parts or grams.
Zinc iodid	15 parts or grams.
Iodin	25 parts or grams.
Glycerin	10 parts or grams.

The iodine destroys all germs in the mouth and cleanses the tissues. The zinc iodid is used to contract the tissues, the glycerin to assist absorption. This preparation is applied to the gums, teeth and mucous membrane by a long, slender applicator with cotton wound about the end. It should be applied as often as every other day if possible. It is not to be used by the patient.

Friction and stimulating methods must be employed by the vigorous use of a "gum massage brush." The brush should be so shaped that it will reach the festoons between all the teeth.

It should be made of the stiffest unbleached bristles that can be obtained. The brush should be inserted into the mouth, the mouth and teeth closed. In performing this operation the mind should be concentrated on the gums and not the teeth. When the tissues have become revitalized, deposits from the alveolar process on the roots of the teeth will cease to form.

One of the best gum washes for the patient to use in connection with "gum massage" is that of the zinc sulphocarbolate recom-

mended by Dr. W. H. Whitslar, of Cleveland. This drug may be used in different strengths and in many forms. The following is a combination which I use:

GUM WASH.

Zinc sulphocarbolate	60 grains
Alcohol	1 ounce
Distilled water	2 ounces
True oil of wintergreen	8 drops

The patient should use this gum wash and massage the gums three times a day. The patient should be under the care of the operator at least two or three times a week, so that he may direct the treatment. The treatment of interstitial gingivitis at the apical end of the roots must be carried out according to symptoms.

Constitutional Treatment.—While the local treatment is being conducted, the patient's general health should be inquired into. A twenty-four hour sample of urine should be obtained, and a thorough laboratory examination made. If there are casts and high acidity, and indican is abundant, meat should be excluded, the patient placed on a vegetable diet, and the acidity reduced. The bowels should be kept open and large quantities of water consumed. There are many methods of cleaning the system and bowels. The following may be used to good effect; a teaspoonful in half a glass of warm water every four hours::

Calcined magnesia (heavy)	$\frac{1}{2}$ ounce
Sodium bicarbonate	$1\frac{1}{2}$ ounces

If the patient has sugar, albumin or other complications, it is best to refer the patient to a physician for general treatment.

By this means of treatment the patient, in the estimation of the average dentist, is cured, not, however, as other diseases of the body are cured. Eternal vigilance is necessary on the part of both operator and patient to prevent blood from again collecting in the blood vessels of the alveolar process, and a return of the disease.

The bone is still an endotransitory structure, and having once become diseased, it is much easier for the stasis of blood again to take place. As the patient advances in years, the excretory organs become senile, poisons collect in the blood, resistance is lowered, and there is a gradual absorption of bone taking place about the teeth throughout life.

31 North State Street.

ABSTRACT OF DISCUSSION.

ON PAPERS OF DRs. LESCOHIER, POTTER, RHEIN, HARRIS
AND TALBOT.

DR. ARTHUR D. BLACK, Chicago: The first most outstanding feature of the pathology of this group of diseases is their chronicity and this has possibly contributed much to the difficulty of a clear understanding of the pathology. This condition,

which I will term a chronic suppurative pericementitis, will, in the average case, be progressive, extending over ten, fifteen or even thirty years. In those cases where we have a systemic cause as the principal one, we would naturally expect to find a general involvement of the peridental tissues. Except for some added local exciting cause, there is no reason why one or a few teeth should be picked out; all of the teeth should be included in the manifestation of the disease where the systemic condition is the principal cause. On the other hand, in those cases where a limited number of teeth are involved, we would naturally expect to find that the local exciting causes had played the primary role. As to the bacteriology, many men have endeavored to find a specific organism which could be associated with this disease, and they have failed. One fact argues against a specific organism as being the cause, and that is the progress in these pockets, and this progress is very much more rapid toward the apexes than laterally around the roots. We observe many cases in which from an original pocket there have developed a number of other surface pockets, without any involvement of contiguous surfaces of the teeth. The tendency is for a tooth to move away from the side of the pocket, because encircling each tooth are the fibers of the peridental membrane. These are on a tension, and when the tissue is destroyed on one side of the root, the balance of those fibers is lost, and the fibers of the opposite side draw the tooth in that direction, unless some obstruction of occlusion prevents this. There never is a detachment of the peridental membrane alongside the root that is not preceded by a gingivitis. In the destruction of the tissues about the root, one of the earliest manifestations of the presence of a pocket alongside the root is a stripping off of these tissues from the cementum. As time passes there is left a connective tissue which has nothing which may differentiate it from a general connective tissue. Those elements, which are necessary to a normal reattachment of tissue to the tooth, are lost. What else has happened? The cementum has absorbed the products of that suppurative process. It has been changed from a positively chemotactic tissue into a negatively chemotactic tissue, which will repel tissue attachment.

As to rebuilding of the cementum: I have examined many cases and seen many in which there has been an absorption, not only of the cementum, but of a considerable portion of the dentin of the tooth, but I have never seen any in which there was a detachment in that area. They were not infected cases; there had been no suppuration. They were not cases in which, if you leave the end of a root, you will find cementum building over it. Dentin has no power of rebuilding cementum. Some one said it was closely comparable to bone. It is, except that it has no circulation. Its life depends on the cementoblasts on its surface. No changes take place within it. As the pocket pro-

gresses farther down the side of the root, we must expect the first absorption of the alveolar process to take place near the crest, and then as it continues around the root, in cases of long standing, we have a funnel formation in the bone. That is one of the marked symptoms of progress of this disease. I would like to criticize Dr. Potter's use of the term erosion in connection with these destructions or absorptions of the bone. It seems to me that the term rarefaction is hardly applicable to these cases, because the bone is either destroyed or absorbed. Dr. Potter spoke of looseness and tightness of some of these teeth. Many times we have a very loose tooth, so far as motion is concerned, and yet it is difficult to extract. As a result of inflammation, the fibers of the peridental membrane which remain attached to that tooth have lost their tonicity; they are not taut, and are apparently lengthened considerably, so that the tooth has an excessive motion, which does not at all compare with the amount of destruction of tissue which has occurred. Treatment will tone up those fibers and they will again exert their normal pull.

DR. FLOYD D. LEACH, CHICAGO: There is a certain amount of tooth movement laterally, that is, from buccal to lingual. Dr. Black said something about a peculiar action of the micro-organisms which caused a destruction of the investing tissues of the teeth, especially along the proximal surfaces of the roots. We have all seen this condition, causing the breaking down of the contents, due to the lateral motion in the act of mastication. It is not easy to guess or feel quite sure that those fibres of the peridental membrane which die to the buccal labial and lingual sides of the socket should take the mechanical strain. I have an idea this condition may be the reason why the progress of the destruction is more pronounced on the proximal surfaces of the roots than on the buccal, labial and lingual. You have always noticed that the pockets are really on the interproximal surfaces. The gum would recede from the lingual, labial and buccal surfaces of the roots, and still in a great many cases be very firm as to attachment. Food substances constantly massaging these areas, and the friction of the brush when a brush is used in cleansing the gums and teeth stimulate to a greater extent those areas on the buccal, labial and lingual surfaces. But I think the mechanical arrangement of the fibers adds more resistance, more tone and more strength to these buccal, labial and lingual vestiges.

DR. RUSSELL W. BUNTING, Ann Arbor, Mich.: We have been told by some that pyorrhea is the result largely of constitutional factors, and by others that pyorrhea is the result of local disturbance, such as infection and irritation. Almost all have agreed that very frequently there are combinations of these two. May I present this view of the situation? May we say that pyorrhea is caused by an exciting condition, such as the infection which destroys the tissues

about the teeth and severs their attachment? But infection is not the determining cause. The determining factors are all the predisposing causes, either local or general, which make the characteristic action of the exciting causes possible. I like Dr. Rhein's statement that healthy tissues cannot be infected. How often have we seen ten times the local infection that would be necessary to produce pyorrhea existing in the mouth, and no pyorrhea present? Why? Because those tissues were so healthy that they were not infected, even under very untoward local conditions. If this is true, we must recognize not only the local but the general conditions as causative factors. As Dr. Rhein said, our constitutional factors are often so obscure that the ablest and most careful internist cannot detect where they are located, or what their nature is. The infective condition alone which is present in the mouth could not have produced the pyorrhea in such cases but for that remote constitutional condition which made it possible for this to happen. Fortunately, we find that very frequently the clearing up of the local causes allows the tissues to come back to an apparent normality.

Can we cure pyorrhea? I have taken the stand that we cannot cure pyorrhea unless we can obliterate the pockets. Dr. Harris said that the pocket may be obliterated because cementum is built on the denuded surface, and that new attachment is had to the tooth. Dr. Black does not believe that pyorrheic teeth can ever have a reattachment. We must admit that if pyorrhea is to be cured absolutely, either the soft tissues must be reattached to the tooth completely up to the free line of the gum, or else the gum line must be retracted down to the place on the root at which it is attached. If it is true that these tissues can never be reattached, why should we not treat pyorrhea by opening the pockets, cutting away all overlying tissue, clear down to the bottom of the pockets, exposing the healthy tissue and allow it to heal? We would then have obliterated the pocket and the pyorrhea. But is that the only way in which it may be done? It is my conviction that the tissues may be made to physically join to the surface of the root after they have been denuded from it in the formation of a pyorrhea pocket, if the conditions are right. I have had many specific instances of pockets, in which I could get one-quarter, one-half or three-quarters of the length of the root with an explorer, or any other instrument, and at the conclusion of a month or two of surgical treatment, assisting the tissues to return to as near the normal as possible, I have been unable to get the finest instrument between those soft tissues and the root of the tooth in the identical place where the pockets had existed previously. What has taken place in those pockets? Are there any other two tissues in the body that would so approximate and still not be physically attached? I do not think so. Let us take a surface view of that pocket. Pyorrhea seldom goes

down circumferentially, attacking the tissues equally. It rather goes down one surface. If we prepare this root surgically and make it clean, we have remaining on either side living, healthy pericementum, which is capable of reproduction and filling in the space with new tissue. This is laid down first in the form of granulation tissue, from which tissues may develop having the propensity to form a bony-like material, or even true bone, which may be deposited on the surface of the root, and attach those primitive fibers, or embryonic type of transitional tissue, to the surface of that root. When a root is resorbed there is in many cases entire breaking up of the fibers. The bone is entirely taken out at a given area and only a transitory type of tissue remains. Dr. Black said that in one case the destruction was not infective and that in the other it was. But was it not destroyed in both cases, and what is the difference? There are cases on record in the literature in which a bone has been cut across; a section has been taken out, and in the gap there has been placed an ivory bit that reproduced as nearly as possible the bone which was removed. Later, that section has been removed and has been examined in microscopic section. It was found that the ivory had about it a layer of new bone which was quite like a lamellar bone placed on the outside of the ivory. Outside of the bony layer a soft tissue formed, quite like periosteum. These tissues had adapted themselves to form a direct attachment of soft tissue by a bone-forming process to the ivory, in which there was no circulation, without which Dr. Black stated reattachment could not occur. We are told that exactly the same thing has been done with platinum in which bone has been laid on top of platinum, and the soft tissues glued to the platinum in the same manner.

DR. EUGENE S. TALBOT, Chicago: I conceive an entirely different condition of things than has been explained to you by Dr. Black and Dr. Bunting in regard to pockets. There is no question about the pathology. It is all laid down in my work, and has been verified in a great many different methods of experimentation. My own researches explain that many of the statements, made by Dr. Black and Dr. Bunting, are much more simple than the points brought out by them. For instance, arteries run through the alveolar process and the peridental membrane. When irritation takes place, whether local or constitutional, the artery is filled with irritation. If constitutional, it may be poison; if local, it may be anything that produces a local irritation. If you will examine the illustrations in my book, you will find that the bone extends around the artery. The irritation, then, is set up in and around the artery, and if there are a dozen arteries there are a dozen points of irritation, inflammation and absorption, and the absorption starts out from the artery. We will say that this irritation is due to lead or mercurial poison. That material is carried down into

the artery, and it may extend clear to the end of the root. What has taken place? Absorption has taken place around that artery, and only one artery is involved. Absorption has gone down to the end of the root. But if the irritation is greater, either constitutional or local, these arteries passing in a lateral direction, as well as those passing longitudinally, may absorb the entire process on the one side of the tooth, while absorption has taken place downward in the other case clear to the end of the root in one or two arteries. To explain Dr. Bunting's point about filling up of the alveolar process with new material if the inflammation has extended down the side of the root, with one, two or three arteries involved, the bone is liable to heal up if the cause is removed. If, on the other hand, the bone has been entirely destroyed downward and pockets have been formed, that bone is never restored, because the fibrous tissue is entirely lost. Bone absorption takes place by halisteresis before the fibers of the peridental membrane are destroyed—just the reverse of Dr. Black's idea.

DR. MEYER L. RHEIN, New York: Not a thing has been said in regard to cemental repair that can be denied under certain conditions, and yet we have listened to statements that appear to be absolutely in opposition to each other. I know that Dr. Bunting is correct in what he has said. I know that exposed cementum can be repaired and the normal condition replaced, but each of the speakers has omitted to state in what conditions repair, or lack of repair, takes place. Dr. Talbot gave a very lucid description of what takes place in the tissue when arteriosclerotic conditions manifest themselves. We get these conditions in certain forms approaching the period of senility, in certain forms of malnutrition, nephritic and diabetic conditions, and under such conditions that repair of the kind that Dr. Bunting spoke of is impossible. Why does a pocket form? We get a pocket on account of imperfect nutrition to that particular spot, and as a consequence there is the impossibility of repair which must ordinarily take place throughout the body daily. The same conditions that produce pyorrheal conditions are at work in erosion, where there is found a continuing loss of gum tissue, exposing the root surface, except that the local resistance, due to many causes, has prevented infection from taking place. In other words, in the retraction of the gum which results in the exposure of considerable of the root surface of the teeth, we meet with the same lack of nutrition that is demanded at every ultimate point of nutritional circulation. Pyorrhea may occur in people suffering from fatty degeneration about the heart. What are the appearances of the mouth in this condition? There is no suppuration. There is no deposit on the roots, but very extensive pockets that frequently go down deep, and we find the gum in ribbons over these pockets. They are great big flabby pockets, with a deterioration in color and character of the circulation. I have never seen one with

any purulent condition. I have seen those gums come back absolutely to what we would consider comparatively healthy gum tissue under the Nauheim treatment. If the malnutritional factor has disappeared after treatment, you may call that patient cured. What is the reason that exposed cementum, considering that there is no condition of malnutrition present, will not permit the tissues to recover? It is due to the fact of exposure of this cemental surface to the irritating fluids that are in circulation. I believe it will take exceptional conditions to permit a cemental surface that has suffered abrasion to repair, because of the danger of retrograde metamorphosis going on (from its exposure to the fluids of the mouth, consequently the therapy must be of such a mechanical nature to cover that cementum that it will not be exposed to the fluids of the mouth. I have done this for many years by coating the surface of such cementum with chloropercha, keeping the exposed cementum hermetically sealed and thus protecting it from the fluids of the mouth.

DR. GEORGE B. HARRIS, Detroit: I have been misunderstood a little in regard to the regeneration of cementum. In the first place, I do not wish to be understood as saying a complete regeneration takes place. The point I wanted to bring out is that there are cases in which the cementum has regenerated, and these cases were not under aseptic conditions. Can anybody imagine the crown of a tooth cut off from below the gingival margins or split half the length of the root with the cementum forming over it, and say that this portion was in an aseptic condition? I do not believe it. Further, where the cementum is diseased we can remove it, leaving nothing but the healthy cementum below, producing a condition that is as near aseptic as it is possible to get under the conditions, a condition at least equal to those mentioned where the cementum did reform. It is possible, then, that the cementum will reform there. Whether it ever has or not, I do not know, because there is no way of measuring it as it takes place in the mouth, unless you would happen to find a tooth where the difference in density of the cementum will show, or where it would be shown by the new cementum making a thicker coating.

DR. G. H. SMITH, Medina, O.: This subject of pyorrhea has been of intense interest to me for five years, and I would like to suggest to the medical profession that they advise more of their patients to select an ethical dentist. Dr. Moorehead made a statement in his address that I can hardly substantiate. He claims that only 10 per cent. of the dentists were efficient. There are dentists commercializing, but with the co-operation and advice of the medical profession many patients would escape many dental disorders.

DR. WILLIAM C. FISHER, New York: I want to ask Dr. Rhein if I understood him to say that in a diabetic patient he would not consider operative procedure as being wise, or that it had been known to even be fatal?

DR. RHEIN: Correct. I said diabetes not under control.

DR. FISHER: I am not thoroughly convinced that a dental operation is precluded in any patient—diabetic or otherwise—who is able to visit your office and go about his business. I believe, of course, in the medical treatment, but I certainly think that there is absolutely no shock, such as that experienced in a major operation, while treating these patients. In pyorrhea I use the several solutions of iodine. Dr. Talbot spoke of gum massage with the brush. Do you mean the hand or engine brush?

DR. TALBOT: The hand brush.

DR. FISHER: I was afraid that possibly you meant the engine brush. In polishing teeth we want to get away from anything that will in any manner injure or tear the tissues, and I have devised a simple little mandril of one piece of steel. I use French tubing of different sizes to fit; and make my polishing powder, mixing in with that iodine. As this mandril revolves in the engine, the French tubing will flare out on the surface and coax up the gum, whether receded or not, and polish the surface beneath the gingiva. In the interproximal spaces select a smaller piece of tubing, and it is possible to get a polished surface there. With that method you get a massaging of the gum which the patient cannot possibly give it. You are massaging the gum at the same time that you are polishing the neck of the tooth where it has been scaled.

DR. W. A. PRICE, Cleveland: Two decades find us almost exactly where we were when I started to practise dentistry twenty-three years ago. We cannot come together and express a common idea relative to the etiology of pyorrhea and be united in supporting and substantiating it. We have made practically no study whatever of protein absorption, which takes place around these pyorrheal infections. A large number of nervous lesions of the body have apparently been traced directly to dental infections and to pyorrhea. The medical profession must bring these patients back to us for treatment, and we cannot even give the A, B, C of the infection in pyorrhea. We do not know the nature or the morphology of 50 per cent. of the bacteria that grow in pyorrhea pockets. They have not been grown artificially. What is the solution? If I were to ask Dr. Talbot how he got his information that has been the great cornerstone for a large part of this work, he would say, "Hours and hours, and days and days, and years and years of hard work." How many men are devoting a worthy effort to this work? We are called on to redouble our efforts to answer with some degree of intelligence this great question of the etiology of pyorrhea, which to-day we know almost nothing about.

DR. HOLLIS E. POTTER, Chicago: I can see now that the pockets we are showing with the Roentgen rays represent more absorption of bone than any such slight detachment as you have been talking about.

I should think that in cases where we are showing Roentgen ray findings of absorption around a tooth, when we are talking about a pocket, it is a very gross condition as compared with the small and limited pockets that the controversy is about this afternoon.

DR. ALEXANDER W. LESOCHIER, Detroit: As Dr. Price said, it is possible that there are many good things we do not know about the bacteriology of pyorrhea, but there is one fact which I do believe has been established, namely, the preponderance of streptococcic infection. I do not mean to imply that the streptococcus is the cause of pyorrhea, bacterial infection being apparently a secondary element, characteristic of the pustular stage and not of the initial condition. But, in view of its potential virulence and the persistency with which the streptococcus is found, it is indicated that certain strains have a peculiar affinity for the peridental tissues. Also that as far as the sequelae of pyorrheal infection are concerned, particularly the arthritic, the streptococcus overshadows in importance other micro-organisms.

DR. H. A. POTTS, Chicago: May I ask if it has been determined whether or not this streptococcus which he finds in pyorrhea is an aerobic or an *anaerobic* one; whether hemolytic or the *Streptococcus viridans*, and what connection there is between the effects of these streptococci of pyorrheal infection and those found in chronic abscess?

DR. LESOCHIER: I cannot answer definitely the questions raised. The work of Hartzell and others has indicated that the *Streptococcus viridans* is found much more frequently than any other type, but hemolytic streptococci are also observed in some cases. I would not undertake to answer the question as to the relationship between streptococci elsewhere and those in pyorrhea and alveolar abscess.

DR. MEYER L. RHEIN, New York: I do not want to let the inference go that I am oblivious to the fact that it is necessary to have an attacking organism when we come to this stage of infection. There seems to be a strong elective affinity of certain micro-organisms to attack the gingival tissue dependent on certain malnutritional predisposing causes. There is a type of pyorrhea due to certain kinds of malnutritional causes where the attacking organism is a protozoon. I have cured three distinct cases of pyorrhea in the last two years with emetin, and I failed in numerous other cases. Now, why should this be? It simply carries out in the ultimate analysis what Dr. Lescohier's paper has shown us, that there is no one specific organism in pyorrhea. The three patients I cured all seemed to have the same kind of malnutritional predisposing causes; they were all cases of intense inflammation and infective conditions in the larger colon. They were cases that had shown symptoms that very closely resembled epidemic forms of dysentery. Now, is it illogical, is it surprising, that in a condition of the kind, where we know the endameba plays the role

of attacking force, that when by reason of this predisposing cause the mouth shows the evidence of pyorrhea we should find the same organism again the attacking force? The place to find pyorrhea is not among the patients who come to the office of the dentist. You will find pyorrhea almost everywhere. About 85 per cent. of the cases that the average dentist treats as pyorrhea are nothing more than some focal infection that has been diagnosed improperly and in which a roentgenogram would demonstrate the error of the diagnosis. In chronic alveolar abscess, with its sinus opening out into the mouth, sooner or later symptoms appear that approach and grossly deceive the careless diagnostician, and there is no reason why you cannot get an alveolar abscess with a pyorrhea complication, if you want to call it such, that is dependent entirely on the apical infection. I have found such a condition in a considerable number of cases. On careful differential diagnosis I could put my hands on the point of focal infection. That is especially true in cases where there seem to be one or two teeth only subject to pyorrhea. When an individual comes with a pyorrhea in one or two teeth, the diagnosis is open to grave suspicion. I have found the focal infection of a pyorrhea showing in an upper incisor, away back in the roots of a second molar, and I recall quite well the difficulty of making a diagnosis in that particular case. I was a little surprised at Dr. Fisher's question as though I was in doubt as to whether operative interference was to be avoided in diabetics where the diabetes was not under control. It is not a question of a major operation that makes a surgical condition a most dangerous proposition under such conditions. I know of no surgeon who would not seriously hesitate to do the most minor surgical operation on a patient showing a large percentage of sugar. It is true that under certain conditions, when it becomes a question of life or death, the surgeon will take chances. He knows the patient is going to die from septic causes, and he is going to give that patient the benefit of that chance. The deaths from teeth extraction in diabetics would fill a very large chapter if they could be brought together.

DR. FISHER: Does that mean from the anesthetic?

DR. RHEIN: No. I am simply stating what is an abstract fact that is settled in the minds of surgeons, pathologists and bacteriologists at the present time. In regard to research work: We have had to have recourse to animal experimentation to a large extent, and I am convinced that all the dental research work on animals in the past is replete with error, because the mouth flora of the dog is so different from the mouth flora of the human that it cannot consistently be taken as the same in any experimental work on animals. This is a very important factor, and it is far better for dental research work to proceed slowly and get results that are not going to be questioned in the future than to make comparisons and arrive at conclusions that cannot be verified.

DR. EUGENE S. TALBOT, Chicago: If you will examine the dental journals, and some of the medical journals, you will find that a large percentage of the pictures that have been shown are represented as abscesses. Dr. Potter has shown us that there are a great many different shades or conditions of the alveolar process which are not abscesses, and the reason for that is that we have a condition of absorption called halisteresis, and not lacunar absorption in the alveolar process, which may be or is due to the irritation that has taken place from the pulp chamber. The degree of absorption will depend on the amount of irritation. In regard to focal infection, the dental profession can hardly be blamed for abscesses at the roots of the teeth after the canals have been treated and filled. Up to within the last two or three years, when an abscess formed on the root of a tooth and the face swelled or a fistula had formed, the only means of knowing that the abscess was supposed to be cured was that the face became reduced to a normal state and remained so; the fistula healed and did not return. These were the only symptoms available when the tooth remained quiet without pain or swelling which led the operator to believe that the abscess was cured. With the modern methods of diagnosis, the Roentgen ray, we have learned that these signs are not for a moment to be considered. The Roentgen ray demonstrates that very few abscesses are destroyed and healed, but that they remain cold or blind abscesses, discharging pus into the tissues for an indefinite length of time. I recall one instance in which an abscess remained on the root of a left superior first molar for fifty-two years.

Get in the "Push"

THE Toronto members of 1902 Freshman Class (whose organization is the only one still existing since college days) is arranging to get its members together for a banquet during Ontario Dental Convention week. All out-of-town members are invited. Get in the "push" and be on hand at the biggest convention O.D.S. has ever held.

E. A. DOLSON, *Secretary*.

April 16, 1917.

185 Dunn Avenue, Toronto.

Canadian Army Dental Fund

D R. C. V. SNELGROVE, Treasurer, Canadian Army Dental Fund, reports a subscription of ten dollars from Dr. J. H. Ayers, Charlottetown, P.E.I.

Major W. G. Thompson, A.D.D.S., M.D. No. 2, Presented With Automobile

MEMBERS of the dental profession and friends of the Canadian Army Dental Corps, M.D. No. 2, gathered at Exhibition Camp, Toronto, at 3.30 p.m. Saturday, March 3, 1917, for the purpose of presenting to Major W. G. Thompson, A.D.D.S., for the use of the Corps, a six-cylinder McLaughlin-Buick automobile in appreciation of the important national service rendered by the Corps, and to meet the absolute need of a car that had arisen with the increased sphere of operations now covered by the Canadian Army Dental Corps in this flourishing military district.

PRESENTATION BY DR. FRED J. CONBOY.

Dr. Fred J. Conboy, in making the presentation, spoke as follows: "Some years ago General Sir Robert Baden-Powell was the guest of honor and was invited to press the button at the official opening of the Canadian National Exhibition. In his introductory remarks he said: 'I am at a loss to understand how in a country as large as Canada, possessing so many prominent and able men, I have been selected to officiate in this important capacity.'" Nevertheless, as the honor had been offered him, he intended to accept it, and that is exactly the position in which I find myself at this hour. I recognize my unworthiness, but having accepted the honor I will endeavor to perform the duties connected with this function to the best of my ability.

"The task which devolves upon me this afternoon is indeed a very pleasant one—to be permitted on behalf of the dentists of this military district to make a presentation to the Army Dental Corps is, in my opinion, a two-fold honor. In the first place, I esteem it a great privilege to be allowed, for even a short time, to represent men and women who occupy such a high position in society and who do such an important work in the interests and for the betterment of their fellows as do the members of the dental profession, and being a humble member of the profession, I may be regarded as egotistical in the remarks which I am about to make, but surely one is justified in saying these things which he believes to be absolutely true and correct. I am convinced that, as a profession, we are prone to think less highly of ourselves than we ought. We have taken to heart the admonition, 'He that humbleth himself shall be exalted,' and that command, 'Let not your left hand know what your right hand doeth,' to such an extent that the members of the other professions and the public generally are ignorant of what we have and are accomplishing, and therefore do not give us that recognition and appreciation that our work deserves. This undue humility has to some extent decreased our helpfulness and usefulness, because we have not re-

ceived the recognition which the importance of our services deserve and should demand; consequently, we have not been able to step up into our proper position of full opportunity and responsibility. This is true in some respects in regard to military matters. Nevertheless, we all consider it a great honor to be known as dentists. We are proud of the men who, in days gone by, have, by their faithful, indefatigable, self-sacrificing efforts made the profession what it is to-day, and we hope in our day to be able to do something to help along this great forward movement.

"Then, again, I consider it a great honor to be permitted to make this presentation to the Canadian Army Dental Corps, to be privileged to express to you, Sir, and to those associated with you, the feelings and sentiments of the dental profession of this military district. While we were all engaged at our ordinary work, comfortably situated, enjoying the association and companionship of our friends, while, I say, we were enjoying great financial and social prosperity, like a bolt from the blue came the first declaration of war. Event followed event in quick succession and with such rapidity that before we were fully aware of its awful significance our nation was at war. Then the appeal came to the profession to do its part, and how nobly you men responded. Many have left lucrative practices, many have sacrificed their life's ambition, you have all left comfortable homes, members of your family more dear to you than life itself, and kindly and congenial associations, and have taken your place in that great army which is to win for the world a grander and higher liberty than has hitherto been its heritage. You have placed your all upon the altar of sacrifice in response to your Empire's call, and what does that mean? When a man of the rank and file enlists, he makes a complete and heroic dedication of all he is and has to his country and his Empire, and as a direct result of that great sacrifice one more soldier is added to the fighting forces of the Allies. When a dentist responds to this call to a higher service, he renders acceptable those who would otherwise be rejected. He increases the efficiency of all, and as a result of his labors many are added to the fighting forces of the Allies.

"There are at the present time hundreds, yes thousands, of brave fellows fighting in the trenches in France and Flanders, or in preparation in the camps in the Old Land and Canada, who could never have taken their part in the defence of the Empire had it not been for the work of the Canadian Army Dental Corps, and so, because of the noble sacrifices that you men of the Dental Corps have made, because of the important and far-reaching work which you are doing, because of your own true worth, the civilian dentists of this military district take pleasure in presenting to you this automobile. We trust that it may be of great assistance to you in your work. We desire that the work devolving upon each member of the Corps shall be

made as light as possible, and that his efforts shall meet with the largest measure of success, and as far as modern and complete equipment will accomplish that end, we are willing and anxious to assist. I do not need to remind you that this car carries with it the confidence, respect and kindest regards of the entire profession, and in handing you this receipt and cheque for fifty dollars, as a small maintenance or upkeep account, we also convey our highest appreciation of the work done by each member of the Corps, and our very best wishes for a successful, useful and happy future in the great work which you have undertaken to do."

MAJOR W. G. THOMPSON, A.D.D.S., M.D. No. 2, ACCEPTED
THE CAR ON BEHALF OF THE DENTAL CORPS.

Major-General Logie, Dr. Conboy, Mayor Church, and Ladies and Gentlemen: The flowing language of Dr. Conboy has almost carried my legs from under me. At this point the General interrupted the speaker to say "that is what the car is for, to take the Major's legs from under him." Major Thompson continued: That any success that the Corps has met with under my command was due entirely to the backing up I have received from Major-General Logie and the members of the Headquarters Staff. Here, again, the General interrupted, saying, "That it was as much a breach of discipline for any officer to approve of a Commanding Officer as it was a breach of discipline to disapprove any actions of a Commanding Officer." Major Thompson continued by saying: "That nevertheless I am quite sincere in my statement as to the assistance I have received from the General Officer Commanding and his staff. It gives me great pleasure to acknowledge the receipt of a thousand dollars from the City Council to purchase an X-ray machine and other accessories necessary to carrying on the dental work in this district. The car is a magnificent gift from the dentists of Military District No. 2, and I know not how to express on behalf of Corps the gratitude that we feel for this gift, and I can quite assure you that the work of the officers of the Canadian Army Dental Corps will be greatly helped by having this car with which to most speedily carry on the details of the daily operations.

I thank you most sincerely, Dr. Conboy, and those whom you represent.

MAJOR-GENERAL LOGIE'S REMARKS.

After examining the automobile and congratulating Major Thompson, the party of about 175 guests adjourned to the Dental Clinic in the Dairy Building, which was decorated elaborately with the flags of the Allies, and herein Hon. Major Harold Clark requested the General Officer Commanding to say a few words to the dentists and their friends assembled. Major-General Logie very graciously consented, and opened his remarks by saying that the service rendered

by the Dental Corps in this district had been most valuable and compared most favorably with the service rendered by other Dental Corps, both overseas and in Canada. The number of operations performed monthly in this district had risen to the astonishing total of over 127,000, and the number of men rendered fit for service by the various Dental Clinics in Military District No. 2 now totalled 16,000. When it is considered that a man is not thought fit for service in France if he has as few as three dental cavities, you will readily see the public service which the personnel of the Corps is rendering. Many of the officers have given up lucrative practices for the very small remuneration of a major or a captain.

The Dental unit is one of the smartest in the district, and furthermore, there never has been the slightest insubordination, much less crime, in this unit. There is an excellent feeling in the unit, which is evident by the smartness of all ranks.

Matters run as smoothly in the Dental Corps under Major Thompson as did Thompson's football machine (the Tiger Football Club).

General Logie proceeded: "It is to be regretted that Headquarters has not yet seen fit to place this service in the status which I think it should occupy, but I have no doubt that, as a result of the services given so generously in this Corps, recognition cannot fail to come, and will come.

"Even more valuable service has yet been given by the Corps in the treatment of returned wounded men. One instance of this work came under my notice recently. A returned officer had a portion of his jaw shot away, rendering him unable to speak. By skilful treatment this officer in a few days recovered his speech. The bone structure in the lower jaw was replaced by a bridge which almost re-formed the arch in the lower maxilla, and much improved the appearance also of the right side of the wounded officer's face."

In closing, General Logie said that he desired to make public expression of how much he valued the services of a unit "which does not advertise, but which does such valuable service to the State."

Special Announcement Ontario Dental Society

50TH ANNIVERSARY MEETING TO BE OF ONE WEEK DURATION
AND OF THE CHARACTER OF A POST-GRADUATE COURSE.

EVERY Canadian dentist should be present at this meeting. It will not be conducted as an ordinary convention with papers and discussions. Teachers will really *teach* and *inspire*. The teachers will be: C. N. Johnson, Chicago; Hopewell Smith, Philadelphia; Forest H. Orton, Indianapolis; W. E. Cummer, Toronto; M. L. Rhein, New York.

The recent research work being carried out by such prominent men as Weston A. Price, Cleveland; Thomas B. Hartzell, Minneapolis; A. Hopewell-Smith, Philadelphia, and many others in the dental and medical profession has shown the enormous importance attached to unhealthy conditions of the oral cavity. This has placed upon the dental practitioners much greater responsibilities than were previously recognized. Do you feel, personally, that you are keeping pace with the times? Are you giving your patients the service which helps prevent dental lesions or, are you content to restore lost tissues in the same manner that was in vogue when you graduated? Very few busy practitioners have the time or facilities to do sufficient research work to enable them to arrive at accurate conclusions. That implies co-operation with other men doing a similar service. If you are anxious to get in touch with the latest and most approved ideas you cannot afford to miss the post-graduate course that is being arranged by the Ontario Dental Society, to be held in Toronto during the week of May 21-26. The programme committee has spared neither energy nor expense in its efforts to give the profession an opportunity to hear some of the leading men in dentistry in the United States and Canada.

Very careful consideration has been given to the selection of the subjects for the course. Perhaps the subject you are especially interested in may not be on the programme, but the committee has aimed at presenting subjects which will be of vital interest to all.

It would perhaps be selfish to confine this course to Ontario alone, so the publicity committee is announcing it from coast to coast. Personal enquiries have already been made by men far beyond the borders of Ontario and a very large registration seems assured. Will you be present?

Arrangements are already about completed with the Eastern Passenger Association for the regular reduced rates to such meetings, and the secretary is endeavoring to arrange a similar reduction for men west of Port Arthur.

The exhibit committee is working hard to have one of the largest exhibits by manufacturers ever held in connection with the O.D.S. meetings. Encouraging replies have already been received. There will be several exhibits this year that have not been shown here previously.

Special arrangements are being made to provide for the social side of the meeting, not only for the men but also for their lady friends, so that the ladies need not anticipate any dull moments while the men are in attendance at the lectures. Toronto will be very much alive during that week with the entertainments which appeal to the sporting instinct in human nature.

All indications point to an ideal week's holiday and the registration fee is only Five Dollars.

PROGRAMME.

I. Crown and Bridge Work.

Perhaps there is no branch of the dental art which is exploited more than the restoration of lost tissues by crowns and bridges. Very pleasing substitutes, from the esthetic point of view, have been made by these methods. But, how about the patients' health and comfort? One of the sad chapters in dental history that is being composed since their introduction will narrate the story of hypertrophied gum tissues, wholesale sacrifice of live pulps, good healthy sound tooth tissue and the formation of spaces and surfaces that cannot be properly cleansed, thus causing putrefaction and filth in the entrance to the alimentary canal that is most disgusting.

The lectures to be delivered on this subject will be very practical and instructive. Here are a few of the points to be considered:

1. Principles involved in banded crowns.
2. Relations of banded crown to pathological conditions.
3. Importance of correct cusp relations and occlusion in crown work.
4. Importance of correctly restoring tooth form in all dimensions.
5. Preparation of root for banded crowns.
6. Importance of correct relations between band and contiguous soft tissues.
7. Technique of double-banded crown.
8. Method of making a removable bridge which compensates for settling of saddle.

II. Periapical Infections (Illustrated by Lantern).

1. Resulting Systemic Diseases.
2. Three essential points in pulp technique:
 - (a) Removal of every particle of pulp tissue.
 - (b) Eradication of every pathologic condition.
 - (c) Hermetical sealing of canal so that re-infection is impossible.
3. Different conditions under which pulps are removed.

Root Canal Technique.

1. Point of entrance into the canals of different teeth.
2. Variety of instruments.
3. Single-rooted teeth.
4. Bicuspids.
5. Molars.
6. X-Ray checking.
7. Calcific degeneration of pulp.
8. Opening of every foraminal outlet.

Roentgenographic proof will be shown demonstrating the ability to force filling material through the end of every foramen. The subjects of Ionization, Apicoectomy, Regeneration of destroyed alveolus and the sealing of root canals will also be discussed.

III. Interproximal Space and Contact Point.

Very little attention seems to have been paid to the contact points and other means of preventing food from wedging between the teeth with the consequent deleterious effects on the teeth and surrounding tissues. This subject will be dealt with very fully. A minute description of the form and significance of the Contact Point and the Interproximal Space, the various agencies which produce faulty contact, etc., and the methods to be used in reproducing the normal conditions will be given.

IV. Dental Economics.

The Real Ethics of Professional Life, with Special Relation to Some of our Recent Tendencies Toward Commercialism.

1. Distinction between Professional and Commercial Life.
2. The necessity for good business methods in the conduct of a professional practice, but the disastrous effects of permitting the commercial to predominate over the professional.
3. The patient's point of view.
4. The dentist's point of view.
5. What is good business?
6. What is professionalism?
7. How a practitioner may combine the two to the best advantage.
8. Investments for professional men, etc.

V. Dental Pathology.

Since radiography has come into such general use, dental practitioners are seeing every day disastrous results of some operation heretofore considered very insignificant. The most important part of our work is the prevention of oral lesions. In order to prevent them, one must know something about their etiology and to treat them successfully implies a knowledge of pathology. Four or five hours of the course will be devoted to this subject. The lecturer will be one of the best men obtainable on the continent. Bring your notebook along. You will not be able to remember the half of the new things he will have to tell us.

VI. Removable Dental Restorations.

After hearing about and seeing pictures of so many diseased conditions which are directly or indirectly attributable to our past methods of treatment, every member will ask himself, "What shall I do?" The committee considers this course would be very incomplete were no efforts made to provide an answer to that question. Consequently the latter part of the course will be devoted to the presentation of some of the latest and most approved methods of restoring lost dental tissue with the least amount of destruction to the remaining teeth, and at the same time securing the greatest amount of efficiency in mastication with the most comfort and cleanliness possible. These talks will be intensely practical, and the cases demonstrated will prove conclusively that better service is in store for the patients of every man who attends the course. You can't afford to miss it.

HORTICULTURE AS A HOBBY FOR THE DENTIST

FRED. G. BRETHOUR, D.D.S.

Spadina Ave. and College St., Toronto

ORAL HEALTH WILL BE PLEASED TO HEAR OF HORTICULTURAL
SUCCESES OR FAILURES AND OF YOUR GARDEN PLANS FOR THE
FUTURE. SUGGESTIONS OR QUERIES WILL BE GLADLY RECEIVED
FOR DISCUSSION IN SUBSEQUENT ISSUES.

Perennials

NOW that the planting time has come, and you have that border nicely trenched and manured, I think the best advice is to put in vegetables. With this kind of preparation you would have to pry your carrots and parsnips up with a crowbar (perhaps). For those who are not stampeded with the famine cry, and want a little bit of color and beauty in the garden, I furnish a partial list of choice varieties which are suitable for cut flowers, and good enough for anybody's garden or for exhibition purposes:

Aquilegia (long-spurred)—These should be treated as biennial, and it is best to put in seeds—a good choice strain like Mrs. Scott Elliott's—as soon as ground can be worked. These will be transplanted into their flowering positions early in fall, and will bloom the following year, and the year after that again. Aquilegia are easily grown in this way and are charming for the border, especially in groups of harmonizing color.

For bloom this year buy the plants.

Achillea—The Pearl or Perry's white.

Aconitum—Wilson's and Fischeri.

Anchusa—Dropmore, Opal.

Anemones—Japanese in variety.

Artemesia—Lactiflora.

Armeria—Plantaguiea Gigantea.

Hardy Asters or Michaelmas Daisies—Feltham Blue, Louvain, St. Egevin and others.

Astilbe in variety—Gloria, Moerheimi, Ceres, Queen Alexander, Gladstone, are good.

Boltonia—Asteroides.

Campanula—Pedsicifolia, white and blue; Moerheimi, Pyramidalis, Glomerata Superba, Media (Canterbury Bells), Pfitzeri, Lactiflora, Alba Magnifica.

Hardy Chrysanthemums or Shasta Daisy—Alaska, King Edward, Robinsonii, Mrs. J. Teerstig, and others in great variety.

Chrysanthemum Leucanthemum Plenun.

Cimicifuga—Simplex.

Convallaria or Lily of Valley.

Dictamnus—Fraxinella Alba.

Coreopsis—Lanceolata Grandiflora.

Delphiniums—In March issue of ORAL HEALTH.

Dielytra or Foxglove (biennials).

Doronicum—Excelsum.

Echinops—Ritro.

Epimedeum in variety.

Erigeron—Asa Gray, Quakeress, Perry's Pink.

Gallardia—James Kelway, Lady Rolleston and others.

Gypsophilla (Baby Breath)—Paniculata, Paniculata Fl. Pl.

Helenium—Riverton Gem. Rubrum.

Hemerocallis—Gold Dust, Queen of May and others.

Henchera—Red, pink and white.

Hollyhocks—Single and double.

Iris—See November, 1916, issue ORAL HEALTH.

(Plant Delmatica and Queen of May in groups.)

Liatris—Pycnostachya.

Linum—Perenne.

Lupinus Polyphyllus in variety—Easily grown from seeds. Often flower same year.

Lilium—Auratum, Tigrinum, Speciosum (Ruboum and Album).

Lysimachia—Clethroides.

Lythrum—Perry's Variety.

Lychnis—Grandiflora, Chalcedonica.

Montbretias (bulbs)—Fine for cutting.

Peonies—See October, 1916, issue ORAL HEALTH. Plant these in October.

Papaver—Nudicaule (Iceland Poppies). These will bloom same year from seed.

Oriental—Plant these in September: Perry's white, Jennie Mawson, Mahony, King George, Mrs. Perry, and others.

Penstemon—Barbatus Torreyi.

Phlox—Rynstrom, Elizabeth Campbell, Europa, Rheinlander, Gefion, Thor, Baron von Dedem, Von Larsburg, and others.

Polygonatum—Giganteum (Solomon's Seal).

Primulas—Pulverulente, Bulleyana, Beesiana.

Pyrethrum—Single: James Kelway and others. Double: Queen Mary, Aphrodite, Lord Roseberry, and others. These are easily grown from seed and are very beautiful for cutting.

Pryrethrum Uliginosum Stellatum.

Rudbekia—Purpurea, Newmanii.

Salvia—Uliginosa.

Sedum—Spectabile.

Scabiosa—Caucasica (blue and white).

Spirea—Aruncus, Flipendula Fl. Pl., Ulmaria.

Statice—Latifolia.

Thalictrum—Aquilegifolium, Purpureum and Album, Dipterocarpum, Delavayi.

Trollius—Orange Globe, Firè Globe, Goldguelle, and others.

Veronica—Subservilis.

To get a working knowledge of these, if they are new to you, get as many good catalogues as you can, and most of them are illustrated. You will learn from them the height, color, time of blooming and much useful information. You will find that year after year there are new introductions, chiefly from the English and French hybridizers, as well as new varieties from Japan and China, coming in. These are usually very expensive at first.

How to arrange your border so as to have an artistic effect, without clashing of colors, and to have continuation of bloom, will come to you by experience. Above all, do not put a plant of one kind here and another there, but rather plant in groups, and do not get everything here listed the first year. Leave room for your tulips and daffodils in the fall, and for your peonies. In such places you can have annuals, such as asters or bulbs or gladioli. These latter are almost necessary at any rate.

Roses are also planted now. See January, 1917, issue of ORAL HEALTH.

After you have your planting done and as the season advances, water intelligently and cultivate persistently, and you cannot help but be proud of your garden.

In every garden there is a place for shrubs and climbers. There is no end to the varieties of shrubs, and these are perhaps the least bothersome, at the same time the choicest of things for cut flowers. As for climbers, besides the roses there are clematis, in variety of the large flowered kinds, and clematis paniculata of the small flowered. There is the polygonum auberti, which is very beautiful, with its long trusses of white flowers and very hardy. There are the wistaria and honeysuckle, and many others.

This list, as I said, is only partial. There is a whole host of other beautiful things, but they come more or less under the head of specialties, and every amateur tries out a few of these every year if he can get them. For the rock garden, if you ever have one, the most beautiful of all flowers can be had. They, of course, are dwarf, and usually not suitable for cutting.

Most of the above plants can be got from Miss M. E. Blacklock, Meadowvale; Mrs. Endean, Richmond Hill; E. M. Mitchell, Port Hope; Rennie; Steele-Briggs; Sheridan Nurseries, 82 Bloor West.

ORAL HEALTH

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Vol. VII.

TORONTO, MAY, 1917

No. 5

EDITORIAL

New Overseas Establishment, Canadian Army Dental Corps

AS we go to press the editor received a memorandum from England containing the details of a new overseas C.A.D.C. establishment. In a letter, accompanying the memorandum, the writer says:

"I am enclosing herewith a copy of the establishment for England, which has been authorized by Canadian Headquarters, and promulgated in routine orders the day before yesterday. Things are consequently looking considerably brighter for the future, and the joy of the present has obliterated the 'impatient' waiting, the up-hill fighting and the bitterness of delay during the past."

This forward step in England will doubtless result, in the near future, in proper official recognition of the work of the C.A.D.C. in Canada and the early announcement of a permanent establishment for the C.A.D.C. on a peace as well as a war footing.

*Appendix to Routine Orders. Director of Dental Services,
C.O.M.F., March 28th, 1917.*

ORGANIZATION—CANADIAN ARMY DENTAL CORPS.

The organization of the Canadian Army Dental Corps, with the

establishments of ranks and appointments as shown below, is authorized:

Colonel	1	Superintending Clerk	1
Lieut.-Colonels	4	Sergt.-Major (W.O. Cl. 1)	4
Lieut.-Colonels (Supernumerary) ..	2	R.Q.M.-Sergt. (W.O. Cl. 11)	2
Majors	10	Laboratory S. Sgts.	20
Captains or Lieutenants	233	Sergeants	258
Quartermasters	2	Corporals	8
		Privates	256
Total Officers		250	
			Total W.O.'s, N.C.O.'s and Men 549

Notes.—(a) Dental officers will be appointed with the rank of lieutenant, but with pay. Allowances and pensions of the rank of captain.

(b) If the candidate has been graduated in dental surgery for one year or over, he will be appointed with the rank of captain.

(c) Lieutenants may be promoted to the rank of captain with one year's service in the Canadian Expeditionary Force, if duly recommended.

ENGLAND.

Directorate and Corps Headquarters.

Detail.	Colonel.	Lieut.-Colonel.	Major.	Captain.	Warrant Officers	Staff Sergeants.	Sergeants.	Corporals.	Privates.	Total.
Director of Dental Services	1	..	..	..	..	..	..	..	..	1
Deputy Director of Dental Services ..	1	..	..	..	..	..	..	..	..	1
Asst. Director of Dental Services, London District	1	..	..	..	..	..	..	..	..	1
Deputy Assistant Director Dental Services .....	..	..	1	..	..	..	..	..	..	1
Research Officer .....	..	..	1	..	..	..	..	..	..	1
Quartermaster .....	..	..	..	1	..	..	..	..	..	1
Superintending Clerk .....	..	..	..	..	1	..	..	..	..	1
Clerks .....	..	..	..	..	..	1	7	..	4	12
Quartermaster-Sergeant .....	..	..	..	..	1	..	..	..	..	1
Storemen .....	..	..	..	..	..	..	..	2	4	6
Total	1	2	2	1	2	1	7	2	8	26

	Dental Officers.	W. O.	Staff Sergeants.	Dental Mch. Sergeants.	Dental Orderly.
Headquarters of a Training Area, 15,000 Troops or over:					
Asst. Dir. Den. Serv. (Lt.-Col.)	1	..	..	..	..
Sergt.-Major .....	..	1	..	..	..
Sergeant .....	..	..	..	1	..
Corporal .....	..	..	..	..	1
Private .....	..	..	..	..	1
Headquarters each Training Bri- gade or area of less than 15,000 Troops:					
Senior Dental Officer	1	..	..	..	..
Laboratory Staff Sergeants .....	..	..	1	..	..
Dental Clinics allotted to each for- mation or unit, including Command Depots upon a basis of one Clinic to each 750 Troops:					
Dental Officer	1	..	..	..	..
Dental Mechanic .....	..	..	..	1	..
Dental Orderly .....	..	..	..	..	1

FRANCE.

	Dental Officer	Q. M.	Q. M. Sergt.	Dental Tech. Sergt.	Corporals	Dental Orderlies
Each General Hospital	1	..	..	1	..	1
Each Stationary Hospital	1	..	..	1	..	1
Each Casualty Clearing Station	1	..	..	1	..	1
Each Field Ambulance	1	..	..	1	..	1
Canadian Base	3	1	1	3	1	5
Each Corps Laboratory	3	..	..	6	..	6

ENGLAND.

	Dental Officers	Q. M.	Staff Sergt.	Dental Mech. Sergt.	Dental Orderlies
A Canadian General Hospital (1,040 beds) ..	2	..	..	2	2
A Canadian Stationary Hospital (400 beds) ..	1	..	..	1	1
A Canadian Special Hospital (800 beds) or over	2	..	..	2	2
A Canadian Jaw Injury Hospital (100 beds) .	3	..	..	3	3
A Field Ambulance Mobilizing for service with an Expeditionary Force	1	..	..	1	1

(Auth. R.O. No. 974, C.O.M.F. 27317). (Reference: A. G. Canadians 7-1-61).

Lieut. A. R. Leggo Dies a Hero

THE official casualty lists recently contained the name of Lieut. Ayton R. Leggo, son of Dr. W. A. Leggo, dental surgeon, Ottawa.

Ayton Richey Leggo was a pupil of the Ottawa Collegiate Institute, successfully passed the Ontario Arts Matriculation in 1911, and became a student of the Royal College of Dental Surgeons, from which college he graduated in 1915, with the degree of Doctor of Dental Surgery and a Dominion Dental Council Certificate. He was an officer of the University of Toronto Training Corps, and won various cups and medals in the University Rifle League. In the summer of 1915 he went to Niagara Camp and was given a commission as lieutenant in the 58th Batt., passing his examination as captain before going overseas in November. While in England, he took courses in signalling at Aldershot and Shorncliffe; at the latter place he



LIEUTENANT LEGGO

Recent Graduate, Royal College of Dental Surgeons.

passed highest in the class, taking

100 per cent. in all examinations, and was made instructor in the Canadian Military School, having charge of all the teaching in the signalling department. He remained on the school staff until June, 1916, when he was sent to France at his own request, and was appointed signalling officer for the Canadian Corps Cavalry Regiment then being formed. Here he saw much active service, and had many thrilling experiences, but when the cold weather came the regiment had to go into winter quarters with their horses. Being told that men with his qualifications were badly needed in the Royal Flying Corps, he transferred to that corps about the 1st of December last, qualified immediately, and acted as observer in the 'plane of a flight commander of the 13th Flying Squadron until he was killed in action on March 24, 1917.

Lieut. Leggo is survived by his parents, Dr. and Mrs. W. A. Leggo, one brother, Ralph C. Leggo, third year medical student at McGill, and one sister, Mrs. Stewart Hawkins, wife of Capt. S. Hawkins, who is a machine gun instructor at Shorncliffe, Eng.

Lieut. Leggo, by his heroic sacrifice, has brought honor to Canada and the dental profession, and his father and other members of his family may feel assured of the sincere sympathy of every member of the profession.

Geo. Gow Honored by King of Serbia

FOR the satisfactory manner in which dental service was performed for the King of Serbia, Lieut.-Col. Gow, with the University Base Hospital at Saloniki, has been rewarded by being decorated with the "Order of the White Eagle," while the "Order of the Savva" was conferred on his assistant.

Such was the information received by Dr. C. K. Clarke, superintendent of Toronto General Hospital, in a letter from a well-known officer with the University unit. His letter, in part, reads as follows:

"Our dental department had come in for a lot of praise lately. Lieut.-Col. Gow was called a couple of weeks ago to see the King of Serbia, for whom he extracted several teeth and made a couple of dentures. This work greatly pleased the old King, and as a result this morning Col. Gow received the decoration of the "Order of the White Eagle," fourth class, while Captain Shields, who administered the anæsthetic for the extraction, was decorated with the "Order of the Savva," fifth class; and Corp. A. Smith, and Privates T. O. and A. W. Jones each received medals of the Crown Prince's Household. This appears to be the only trouble that the unit has got into lately."

The Ravages of Dental Disease



IN some cities and states
unvaccinated children
are excluded from the
schools. Unhealthy
mouths, decaying teeth
and neglected gums are
doing far greater damage
to the people of this
country than small-pox.

HARVEY W. WILEY, M.D.



FOREST H. ORTON, D.D.S.,
ST. PAUL, MINN.

*Professor of Crown and Bridge Work, University of Minnesota
Dental College.*

ORAL HEALTH

A JOURNAL THAT STANDS FOR THE "OUNCE OF
PREVENTION," AS WELL AS THE "POUND OF CURE"

VOL. 7

TORONTO, JUNE, 1917

No. 6

Proceedings of the Fiftieth Anniversary Meeting--- Ontario Dental Society.

POST GRADUATE COURSE, MAY 21ST TO 26TH, 1917, TORONTO.

PRESIDENTIAL ADDRESS.

ROSS THOMAS, D.D.S., LONDON.

Mr. Chairman and Members of the Ontario Dental Society:—

WE are gathered from far and wide to celebrate the fiftieth anniversary of the founding of this society. Its founders did vastly more than they ever knew or dreamed. It has grown from a very small beginning to be the pulse of the Dental Profession of this province. There are many men in this room to-day, who, like myself, would feel lost if they did not attend every meeting. Of the earlier history of this society I can tell you very little, and I am informed by the Archivist that the records previous to 1885 have been lost. In that year the society was reformed at London. I say reformed advisedly, for Dr. Webster says that for a few years previous to that time it had fallen into the hands of a "gang of Shisters." It seems strange to me that a society of intelligent men such as we could go so long a time without permanent organization. I am informed on good authority, as we are not an incorporated body, that if our Programme Committee should take it into their heads to spend a large sum of money for whatever purpose that we are all severally and collectively responsible for the same. I would like to see something done to remedy this serious defect. Could we not appoint a strong committee to enquire into this matter, and get us limited incorporation

from the Government at once? It would be a nice thing for us to be able to buy life membership in this society for a sum of money, say, fifty dollars per head, and let that money be invested as a sinking fund, the revenue of which would be sufficient to provide for the fixed expenses of any meeting, and would not leave the committee in charge at the whims of the membership for funds to run a meeting during any particular year. This life membership need not necessarily exempt anyone from paying his or her annual fee. Let the active members, who only attend as they fancy, pay the annual fee as at present, and elect half of a Board of Control, the life members electing the other half. The president could then be elected by the Board from the vice-presidents, who are the presidents elect of the Local Dental Societies of the province as at present. It would seem to be a fitting way to celebrate the fiftieth anniversary of this Society by giving it a legal status and putting it on a solid foundation.

It is a privilege to attend a meeting such as this. It is filled with good fellowship. It gives a man a chance to discuss subjects of his profession in his technical language so that he does not forget how to express himself. There are high ideals set up, too. Something worth striving for. 'Tis here that we meet the highest men in our profession face to face. We are able to see them, hear their voices and get in close touch with them. We have all of us looked upon Dr. C. N. Johnson as the Daddy of our profession, but to many of us he is as mythical as Santa Claus. His "say so" has always been law to us. We have the most implicit faith in him. Here we are to meet him. There are others, too, but time does not permit.

A profession is as great as the rank and file of which it is composed. It should always be the aim of its controlling factors to keep the men in the rank and file as proficient as possible, and get for them the respect of the community in which they live and work. How can this best be done? What is being done by our College Board? I think it would be fair to the public if we were all brought back every few years and asked to write and pass our examinations again. What would you think of having an inspector with power to act? Every little while some one will tell you that he read that in So and So's book. It is enough to make So and So turn over in his grave if he is dead, and if he is not, any court in the land would look upon it as a case of justifiable homicide, the book being so old. Why are the rank and file not practising better dentistry to-day? The men who need this meeting the most are not here. Why? I can't tell you, but the excuses that some of the men I asked, if they were coming to this meeting, gave, were not sufficient to have kept me away.

How are we going to get the best men to take up the practice of dentistry? We need more men, but we have room for only the best. Young men go into professions for the reason that they think they can earn good livings for themselves and their families easier than

they can in business. Before they start they are not well read on ethics, and have not the same high ideals that you and I have. They have to be shown where the money to have that good living is coming from or they will not come. At a meeting of the London Dental Society last winter, Dr. Webster made the statement that "a dentist was not a reader, for the reason that he had to work so hard and for such long hours that he was too tired to read when he got home." What is the use of being educated if you have to work harder than a laborer to earn your living? It is all right to work hard, but to have to work hard to get the substance of life out of the work in hand when you are a dentist is a crime to be laid at some one's door who is responsible. In the country in which I live there are 110,000 people and only twenty-eight dentists to care for them. This condition illustrates the element of opposition. It is all help. It is the same all over Canada. In order that our graduates can keep up the pace that is being set by the best men of our profession, they have to receive more compensation than they have in the past, and the only way this can be done is for them to have a good grounding in costing and accounting. The College did not teach this when I went to it, not so much because it did not want to, but because it did not know how. There are very few graduates to-day who have any idea how much it costs to do business. If they did they would not sell their services for less than they cost to produce them. The new technical operations on root canal dressing, amputations, scientific painless extraction, prophylaxis, the only things that take dentistry away from the mechanic's realm, that hundreds of our men have slopped over for years, and for which they collected no fee and they were not worth any fee the way they were done, take so long and have to be done so carefully that the men who do not know what they cost to perform them will be in the House of Refuge before they know it, if they do not learn costing in their business. It is a crime to guess at it. In the mercantile world business done in the manner that most of us do ours, would land us in jail for attempting to defraud people from which we were purchasing the goods that we were selling, by not keeping proper books.

It would not be possible for me to pass this opportunity to praise the work of the C. A. D. C. You all have, no doubt, read the story of the work as done by the French Army Dental Corps, told by Dr. De Argent, at Montreal, last September. The story as told by Col. Clayton on many occasions, is very similar in general. Our men have done a wonderful work. It will be even greater in the future. Their services will be even more appreciated after the war, when the events that have taken place, will have been smoothed out so that we can get a comprehensive view of what has taken place. We sorrow deeply over the good friends that we have lost, and we are glad when those of our friends receive the well merited promotions that are

handed out to them from time to time, and we wish them God speed.

I wish to take this opportunity to thank you for your kindness in electing me to this position. It is a proud moment indeed in the life of one of the rank and file to be given this honor, and it is with a heart full of joy and thankfulness that I try to express myself to you.

I wish to join with you in thanking the committees for their untiring efforts in bringing this meeting together. They have given us a programme that will live in our memories as the best ever. I know that you will all show your appreciation of the efforts of those who will address us from this platform from time to time. It is no small sacrifice that they have made to be with us and we must show them every courtesy.

The manufacturer has certainly done a very great deal to make our lot happy. It is indeed wonderful the beauty and usefulness of the equipment and materials that they provide for our comfort. They have spared no expense or trouble to give us the benefit of their efforts in all the latest ideas at this meeting, and we extend to them our heartiest thanks.

THE SUBJECT OF ROOT CANALS AS PRESENTED BY DR. M. L. RHEIN.

W. B. AMY, D.D.S., TORONTO.

THE following paper is a fragmentary report of a series of three exceedingly interesting and instructive lectures delivered by Dr. Rhein, of New York, before the Semi-Centennial Convention of the Ontario Dental Society in Toronto, May 21st-26th, 1917.

In the first place, Gentlemen, let me warn you against the danger of reaction on the present prevalent theory of local foci of infection around the roots of teeth. At all times our general tendencies are toward extremes in all our theories.

The value of many discoveries is greatly reduced by unbalanced minds, bringing them into disrepute and ridicule. We are confronted to-day with the same danger because so many men with small minds are making deductions that all diseases arise from infections at the ends of the roots of teeth.

Twenty years ago I made the statement that many cases of Endocarditis came from dental lesions. This statement, of course, was ridiculed, but we find to-day that my belief was correct, and to a greater degree than ever I imagined. My own candid opinion is, that if it were not for the immunity provided within our bodies, the dental work which has been performed for the last forty years would have killed more people than the present war.

Let me tell you right here, though, that I at no time made the statement, nor even intimated, that lack of knowledge in dental work was the cause of all these diseases, but, I do say, that lack of know-



M. L. RHEIN. M.D., D.D.S.

ledge, together with the faulty technique of filling root canals, has been, and is, the cause of many diseases which in former times has been blamed on other parts of the body.

Many believe that there can be no infection without pus, but Rose-now, one of the greatest bacteriologists on the North American Continent to-day, has proven that toxines existing at the end of the roots in granulomas or blind abscesses, where no pus is present, are possibly the most dangerous forms of peri-apical infections.

In the suppurative abscess there is a natural defence in the alimentary tract, but in blind abscesses we almost invariably find strepto-

coccus viridans, a low form of the streptococcus group, not capable of even producing an inflammation. They have so little virility, and yet some of the worst cases of Toxemia have been traced to this source when the patient has not had the least local discomfort. These morphological tumors forming around such roots are possibly filled with this low grade streptococcus, producing it is true, at times, some toxins that are pus producers, but they remain in and are carried by the circulatory system throughout the body, being held by the part that presents the least immunity to that species of bacteria. These bacteria will here make their nest and trouble will soon follow, or it may be not for years.

It is important that devitalized teeth to-day, should be handled in such a scientific manner that there shall be no danger of reinfection forever. Fifteen years ago I was criticized as ridiculously slow in my root canal work. I then thought I was doing good work, but since then, I have, I believe, replaced 25 per cent. of my root canal fillings, having found them faulty and some with infection. My present technique is the result of constant evolution, and to-day, I find that I take three or four times as long as I then did to fill root canals.

One thing I wish to impress on you is: A man who takes the platform and cries "*too much time*" is insincere and dishonest, or he does not understand what is expected of him. Most teeth, even with anastomoses can be cleared out and filled. There are probably 10 per cent. that should be extracted, and let me tell you, that in no case has a dentist any right to retain a tooth in the mouth of a patient when he knows that the root has not, and cannot be, properly filled. No dentist should keep as a patient any person who will retain an infected tooth against his right and proper judgment.

There are three essentials for the proper filling of root canals:

1. It is necessary that every particle of pulp tissue should be removed. *Every particle!* You must go through the foramina of every one of them and must know that you go through by examination with the X-ray.
2. It is necessary that every vestige of infection in peri-apical areas be removed.
3. It is necessary that the root canal be hermetically sealed in such a way that it cannot be reinfected.

There should be insulation or escapulation of root ends so that the osteoclasts and micro-organisms cannot work on these denuded areas. This is not possible in all cases, but the longer we work the better it can be accomplished.

There are two ideals for which I work:

1. The advancement of our profession for the welfare of humanity.
2. The advancement of our particular specialty to such a position that it will cope with this subject in such a way as to elicit the admiration of the professions and the laity. We, as den-

tists, are heirs to a heritage of which we have not yet taken possession.

Bacteria hunt for nutrition as other bodies do, and their nutrition is dead tissue. They build their nest possibly at the end of the root and in time cause the destruction of an area of the alveolus by virtue of superior force. Until the structure is restored that tooth has not been properly treated, in fact is a failure that must be rectified or eradicated.

One of the misfortunes of dentistry is the pride some men have in the aesthetics without regard to the usefulness of the work to the patient. While I do not wish to detract in the least from the beauty of the aesthetic, I must emphasize the fact that the work must be of the greatest possible use to the patient and not a source of future trouble.

There is among our dentists a lack of attention to diagnosis. He wishes to get to work too soon, thinking that he should be working to be earning his fee. Do not do things without knowing what you are doing them for.

Peri-cemental abscesses and apical abscesses are often wrongly diagnosed as pyorrhea. Use your X-ray frequently. The time has gone by when a dentist can get the best results without this great helpmate of the dentist.

There is an immense amount of work still to be done to find out the diseases that attack the pulp. I am opposed to placing crowns over vital teeth, on account of the disease of the pulp, which invariably follows. As a clinical factor we are more acquainted with the disease known as calcific degeneration or pulp nodules.

Every time there is an injury to the tooth it is felt by the pulp, the heart of the tooth, and some manifestations occur, such as calcific deposits, peri-apical irritations, etc.

Our greatest difficulty in accepting the technique for opening into root canals, is an apparently inherited tendency to conserve as much of the crown of the tooth as possible. Do not value conservation in the face of danger. We must reach the ends of roots and sacrifice crowns to do so.

Use Roentgenograms as a guide for the study of the roots you are working on. What is the use of putting on a beautiful crown if the end of the root is diseased and a menace to the health of your patient in the form of arthritis, endocarditis, etc.

My technique for removal of root canal contents:

Having opened up the pulp cavity so that all the root canals are as accessible as possible, get rid of pulp contents by instrumentation. Remove by use of barbed broaches. I have found Adlers, manufactured by Twentieth Century Co., the most useful, as they are almost unbreakable, and are impervious to acids. Be careful and do not force broaches too much, as you will clog up canal. When more

accessible parts have been cleared up, next use what are called Apexographers, put up by the same company, on the ends of which are a couple of small barbs, which enable us to carry small particles of sodium-potassium into the canals, which, by virtue of its great affinity for water, destroys the remaining pulp tissue. When we have once reached the end of the canal in this way, we can enlarge by means of Kerr's files or any instruments of a similar nature. Sometimes we cannot get wholly to the end of the root because of obstruction of root by deposition of bone, in that case use Gates Glidden drills or reamers.

Calcific deposits in root canal can be gradually worked around by Rhein's picks with sodium-potassium and a large amount of patience. You may also use sulphuric acid if you so prefer.

When we have penetrated as far into the canals as we think possible, insert gold diagnostic wires, and check up by means of the X-ray. The time is past when we can say that a pulp canal filling is not really good, but it is as good as she can afford. Be honest with yourselves,—it is either perfect or imperfect.

We will now discuss the destruction of a granuloma or tumor on the root.

As early as 1897 I presented a report on Ionization for the removal of pathogenic tissue at the end of roots. Since then I have increased the use of Ionization, because I am convinced that thereby we can remove these granulomas and make the tooth healthy, except in cases where the root is necrosed, where both ionization and apsectomy can be employed. In ionization you must guard against failures by remembering that the removal of large tumors is not as easy as small ones, and that their removal depends on the time and power used. The time varies from five minutes with one milliampere of current to one hour with one milliampere. Raise milliamperes as high as patient can stand.

I place the anode in the root canal after it has been opened right through and the cathode as near the anode as possible,—I use a wet sponge on cheek. Place zinc chloride or some compound of zinc with a physiologic salt solution in root canal.

After ionization I have my assistant bring all the necessary root canal instruments, cotton points, gauze, etc., from a Pentz electric sterilizer. Now with a wash composed of 2 ounces of bichloride of mercury and $1\frac{3}{4}$ grams of Marchand's hydrogen peroxide I wash out my canals. The sublimate seals the ends of tubuli and prevents reinfection therefrom. If any moisture is left in canal, I use sterilized cotton points and hot air.

Technique of filling root canals:

With broach carrying small amount of cotton dipped in chloroform wash out canal to dehydrate. Now, with pink base plate gutta percha, dissolved in chloroform to a consistency thin as water, pro-

ceed to fill the root canal by dipping a broach with small amount of cotton thereon into the chlora-percha and carrying to canal, working it into place by pistonlike action. This is bound to penetrate tubules and foramina. Select gutta percha points such as S. S. W. Co. put up, the same diameter from end to end, sizes 1 to 12, sterilize in 10 per cent. formalin solution and place on sterilized Johnson napkins. Introduce a small section of the size that will go to end of root canal you wish to fill, and using small canal plugger, pack well. Moisten canal every once in a while with chloroform and add other sections of larger gutta percha points that will approximately fit the canal and *pack, pack, pack*, until the canal filling is one homogeneous mass. Cover this with oxychloride of zinc cement. This technique applies to all root canals. Do not use heat in packing gutta percha. Many times the patient will complain of soreness of the tooth from a few hours to two or three days. There is no cause for worry if the work has been done aseptically.

Application of high frequency current will help to relieve this pain.

A word on medications: The technique of root canal filling is based on the principles of surgery, and I may say, that I have not used medicaments for root canals for twenty years.

Use of X-ray:

Focus cathode as closely as possible on the tooth in which we are interested. Roentgenograms that are taken too fast do not show enough detail. I find that four milliamperes of current used for twenty seconds, gives the most satisfactory results. In aperture which should be made as small as possible, I stuff cotton to exclude all but the direct rays.

Finally, do not place too much reliance on the Roentgenograms alone, but using your clinical history therewith, generally speaking you have a good basis on which to work.

All of Dr. Rhein's lectures were profusely illustrated with slides, conclusively demonstrating that his stated facts were not theories of his fertile brain, but actualities occurring each day in his own practice.

RHEINISMS.

It is important that devitalized teeth to-day should be handled in such a scientific manner that there shall be no danger of reinfection forever.

A man who takes the platform and cries "too much time" is insincere and dishonest, or he does not understand what is expected of him.

A dentist has no right to retain, in the mouth of a patient, a tooth whose root has not, and cannot, be properly filled.

No dentist should keep as a patient, any person who will retain an infected tooth against his right and proper judgment.

All dentists should work for the advancement of their profession for the welfare of humanity, and for its advancement to such a position that it will elicit the admiration of the professions and the laity.

We, as dentists, are heirs to a heritage of which we have not yet taken possession.

Do not do things without knowing what you are doing them for.

Do not value conservation in the face of danger; we must reach the ends of roots and sacrifice crowns to do so.

The time is past when we can say, "a pulp canal filling is really not good, but it is as good as she can afford." Be honest with yourselves,—it is perfect or imperfect.

CROWN AND BRIDGE COURSE AS PRESENTED BY DR. FOREST H. ORTON.

IRWIN H. ANTE, D.D.S., TORONTO.

THIS discourse was given in two lectures, illustrated with lantern slides and special mechanical appliances.

What are the standards? Where is there a classification for crown and bridge work? How are we to judge which particular treatment should best be followed in a given case? Such discrimination does not seem to have come within the purview of the respective authors of the various methods of crowning, and the superlative claims for universal application which have heralded each new method have left us more or less skeptical in regard to them all.

There is no doubt about the fact that in no department of our clinical work are we confronted with more unfavorable conditions than in those indicating crown and bridgework. In all this field we may expect, as a rule, not only a loss of interproximal space, but also an alteration in the position of the opposing tooth, resulting to greater or lesser degree, in a change in the occlusal plane of that particular tooth.

Perhaps the most common fault found in this work results from the failure to study carefully the changes which almost invariably take place in the opposing tooth or teeth from loss of function; nor has the practical application of our knowledge of the condyloid path, and of the various movements of the mandible, been sufficiently emphasized. The failure to observe or to take into consideration the significance of the movements will account for many of the unfortunate consequences for which we hold the fixed bridge responsible. In so far as these conclusions apply to crown and bridge work, Doctor Orton suggested the following:—

Owing to the slight inclination of molar teeth, there is a corresponding slight deviation of their long axes from the perpendicular line. As a rule, the molars of the upper jaw are a little inclined toward the buccal, and the corresponding teeth of the lower jaw will have a slight lingual inclination. The result is that the buccal cusps of the upper teeth will be a trifle shorter than the lingual, and the buccal

cusps of the lower teeth will present cusps a trifle higher than the lingual. This arrangement of the teeth is in harmony with the plane of the temporo-maxillary articulation, and the various movements of the jaw constitute a very important factor in the problem of crown and bridge work.

For example: with the teeth in normal occlusion and arranged as described, when the jaws move either to the right or left, there is occlusal contact on both sides of the arch and an equal distribution of the stress. But when the cusps are placed on a level plane (no lingual or buccal inclination) when the jaws move to the right, on the left side of the long buccal cusps of the lower teeth oppose the long lingual cusps of the uppers and thus compensate for the lowering of the jaw upon the left side, due to the inclination of the condyloid path. When the jaw is moved laterally there will be occlusal contact on one side only.

In the construction of our posterior crowns or bridges, we should reproduce this lingual or buccal inclination. Also the sentiment which often restrains us from trimming down an elongated tooth in the opposite jaw, "because it is a perfectly good tooth," is a fallacy. We must conclude that such a tooth may be a sound tooth, but not indeed a good tooth, until it is made to function normally.

We must remember that in our crown and bridge operations we are held accountable for the pathologic sequence which may follow malocclusion. Owing to the rigidity of a crown or bridge and the increased stress of mastication on bridge abutments, we must restore articulation without a flaw in order to avoid the evil consequences of malocclusion.

Because of the serious obstacles which hinder the reproduction of other important anatomical lines in the carving up of this work in the mouth, it is necessary, *first*, to obtain a cast and occlusal contact of that segment of the jaw for which to construct the crown or bridge, and, *second*, to reproduce the occlusal surface as nearly as may be, in order that any irregularities may be met before the work is completed; for even if the occlusion is perfect in the mouth, it is not sufficient evidence that the crown or bridge will articulate perfectly. This precaution does away with the grinding down of the occlusal surface. The perfect reproduction of the occlusal surface is only one factor in the production of the favorable conditions toward which we strive. From a biological point of view, every line in the tooth has a meaning, and if we are to have a scientific standard for procedure, we should recognize at least those lines in each case which are favorable. The pathological conditions of the soft tissues about a large percentage of crowns, and the frequent production of unfavorable conditions, acting as predisposing causes for the formation of caries in the approximal surface of the adjacent teeth, emphasize the fact that

much of our crown work is inferior to the normal condition which the crown displaces. In fact, some crowns do not resemble the natural tooth in a single essential. Our ideal crown, therefore, must be one that will exactly reproduce in all its essential details that particular tooth which it is intended to replace, bearing in mind the age of the patient and the variations from the normal which may be necessary to reproduce, in order to have the crown in harmony with its environment.

When we make a ferrule crown, we are confronted by another factor—the principle that an exact duplicate is necessary of the gingival contour of the enamel, normally covered by the free gum margin. The effect of persistent local irritation upon these tissues is too well known to need comment. It is a most difficult matter to restore this essential feature of the tooth's anatomy with a flat band. As a matter of fact, the steps in the usual method (cutting a piece of gold plate to measurement, bending to circular form, soldering, conforming to the shape of the root, trimming, and forcing to position) sound very simple, but they, by no means, constitute the only difficulties we have to contend with. The contouring of the mesial and distal sides of the band to the marble-like contact and of properly shaping the buccal and lingual surfaces without distorting the gingival adaptation must be attended to.

When the gingival enamel is removed and the root is prepared for the reception of the ferrule, a space is left representing the shape of the removed enamel. If the ferrule does not exactly duplicate the enamel, or fit the space, an unfavorable condition must be produced. In other words, the gum should hug the crown as closely as it did the natural tooth.

The preparation of the tooth for the reception of a ferrule crown depends upon our knowledge of the necessity for understanding the relation of the enamel and dentine to the contour of the tooth. And especially is it important to know the form of the enamel as it approaches the cementum.

It is generally conceded that the ferrule should extend rootwise as far as the gingival line, and as the gingival line is usually the most constricted portion of the tooth, the tooth must be scaled at least as far as this constricted gingival line, if we are to have a ferrule in close contiguity around the entire gingival circumference. How are we to be certain when we have scaled the tooth sufficiently to obtain this necessary condition? Will the removal of the enamel be sufficient to give us parallel walls, or does the dentin make up part of the gingival contour?

Even the removal of the enamel in its entirety from the dentin, for a space upwards of 2 mm. underneath the gum tissue, without in any way injuring it or the periodontal attachment, requires so high a degree

of surgical skill, and is so laborious an operation, burdensome alike to the patient and to the operator, that we must be quite sure of its necessity before insisting upon it as a normal procedure.

The contour of the tooth is made up almost entirely of the enamel, beginning at the gingival line with a feather edge, which gradually increases in thickness until the cutting edge or points of the cusps are reached, at which point we find the thickest enamel. This enamel will be found thicker underneath any ridges or elevations on the various surfaces, the thickening formed by the increased convexity of the outer surface. The dento-enamel junction or axial walls of the dentin pass toward the occlusal with little or no convexity, and with only a slight inclination toward the axial lines of the tooth. The exception to this rule will be found in those teeth which go back to a very primitive type, in which extremely bell-shaped teeth the axial walls of the dentin on the mesial and distal surfaces are not inclined toward each other, but are almost parallel.

If this anatomical description is accurate, we see that by removing the enamel in its entirety we have by that operation alone produced an almost ideal root preparation for the reception of our ferrule.

The outline form of the dento-enamel junction is practically the same as the outline form of the dentin at the gingival line. We may easily verify this by using an extracted tooth; obtain the shape at the gingival by fitting a brass ligature wire around it at this point, and then grind down the occlusal until the free margin of the gum is reached. Now place the outline form of the gingival obtained from the wire ligature over the dento-enamel junction at the free margin, and it will be found to be almost identical. If we are to obtain perfect adaptation of the ferrule at the gingival, therefore, the removal of all the enamel at this point is obviously necessary, and if during the operation we bear in mind the points at which we may expect to find it the thickest, the procedure will be controlled by a more intelligent direction.

There will be found a thicker enamel upon the mesial and distal than upon the buccal and lingual surfaces, and again thicker enamel upon the distal than upon the mesial surface; and the fact that on the disto-lingual-angle line we find the thickest enamel makes this the most difficult point to scale. This thickness we might expect, as the mesial root is larger and wider bucco-lingually than the distal root, which has as a rule only one canal, while the measurement of the periphery of the crown is the same bucco-lingually on the distal as upon the mesial surface. On the upper molars there is usually found a thickening of the enamel upon the mesio-lingual and disto-lingual-angle lines, which is especially difficult to scale. This thickening is probably due to the lessened mesio-distal diameter of the lingual root over that of the two buccal roots. Another point to be

noted in an upper first molar from which the distal convexity has been cut off, is that the enamel passes higher gingivally on the lingual than upon the buccal surface; and in a buccal view, at the point of approximal contact, it passes higher upon the distal than upon the mesial surface. This important anatomical point may usually serve as a guide for trimming and festooning the ferrule as well as in scaling the root.

The diminution of the natural crown, or its remaining walls, in a manner favorable to the requirements, is frequently a very difficult procedure, because of the usual inequality in teeth of normal proportion between the diameter of the crown and the cervix. This requires the removal of considerable tooth structure in order that the circumference may be reduced at every point occlusally and at the uniform expense of each surface, at least equal to the exact dimensions of the cervix.

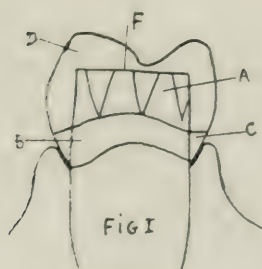
While it is, of course, desirable to leave as much as possible of the remaining coronial portion, it will be observed that approximately about one-sixteenth of the structure of the axial walls, and the occlusal one-third, must be removed.

PREPARATION OF CORONIAL PORTION OF THE TOOTH.

As this portion of the operation is particularly trying to the patient, a good assortment of stones, disks and burs (kept sharp, even-edged, and mounted true) is essential. While grinding, the stones should be kept wet with water as hot as the patient can stand it. Remove the occlusal one-third with stones, starting at a point on the disto-occlusal, and cutting forward; making one cut sufficient to remove that portion of the tooth. The mesial surface is removed with carborundum disks retained in the straight hand piece. Start at a point on the mesial occlusal at the dento enamel junction, and with a distal inclination of the disk remove the mesial portion of the tooth. The distal portion is removed in same manner, except that the disk is held in the right or contra angle with a mesial inclination.

On the buccal and lingual surface a half-inch disk is used, and the enamel is grooved about 2 mm. apart with the long axis of the tooth. With sharp chisels clip off the enamel on the buccal side and as much as is possible on the lingual. It is difficult to remove the enamel from the lingual surface with a chisel, so enamel scalers are used for this purpose. They are short, heavy instruments of different shapes, held in Harper's handles so as to be able to secure a firm grip.

We still have the short root enamel at the gingival to remove, which is the most difficult. On the mesial and distal surfaces this is undermined with half-inch concaved disks (Joe Dandy) then with the enamel chisels and cleavers remove the gingival enamel margin.



The root is now ready to receive a cap. Take a wire measurement of the root at the gingival and construct a band or ferrule of 22K, pure gold, or silver 31 gauge, sweat the joint to prevent stiffening. Fit this band to the root of the tooth, carefully trimming it to the gingival contour. This band only touches the root at the gingival, and it is desirable that it should be adapted to the axial walls. Slit the band in four or six places, from the occlusal down to about 2 mm. from the gingival (Fig. 1A), thus making V-shaped spaces in the band. Burnish same closely to the axial walls of the tooth, trim flush with occlusal surface, remove and solder on a top of same material. (Fig. 1F.) This gives us a root cap that fits the end of the root perfectly in every way except at gingivae, which we are not sure of. Now to be sure that we have an absolutely perfect fit at that point, a second band is constructed of 28 gauge 22K gold about 5 mm. wide, and this is driven up to the extremity of the cap, thus forcing the first band or cap tightly into place around the neck or gingival portion (Fig. 1B), of the root. If there is a depression at the gingival, force moss fibre between the two bands (Fig. 1C) in order to force first band tightly to place, thus reproducing the gingival contour.

Remove both bands intact and cover with inlay wax (Fig. 1D), insert into mouth, have patient close teeth together and also grit the teeth so as to produce a lateral movement of the mandible. By these movements we secure a crown with correct occlusion and articulation. Remove the crown and carve the wax to correct anatomical form, insert sprue wire invest and cast with 22K gold.

To construct a lower hygienic bridge, the crowns are made as described up to the stage of the frame work; the gold is not cast to the side and occlusal surfaces. An impression is taken with the two skeleton crowns in place and an investment model made. Three wires of 12 or 14 gauge clasp metal are soldered between the crowns, extending from the region of the lingual and buccal cusps of both crowns, and the third beneath and between both of these toward the gum line but not touching the gum. Build inlay wax upon this crib-work and about the crown, insert into the mouth, have patient close teeth together and grit same, remove and carve to anatomical form, invest and cast.

TO CONSTRUCT AN UPPER POSTERIOR BRIDGE WITH PORCELAIN FACINGS.

After securing the investment model with skeleton crowns in place, the facings are ground into place. Two bars are then inserted at convenient points so as to be free from the pins of the facings. Inlay wax is flown over the crowns and upon the lingual surface of the facings; same is roughly carved and tried in the mouth to verify the occlusion and articulation. Remove, carve to correct anatomical form, insert one or two sprues, remove facings, insert graphite into the holes in the wax made by the pins of the facings, invest, cast, drill out graphite, fit facings and cement to place.

Dr. Orton does not exploit a banded crown, but it has a function, and if we are going to continue to use it, then it should be made right.

MODERN PARTIAL DENTURES COURSE AS
PRESENTED BY W. E. CUMMER, D.D.S.,
TORONTO.

W. A. LOVERIDGE, TORONTO.

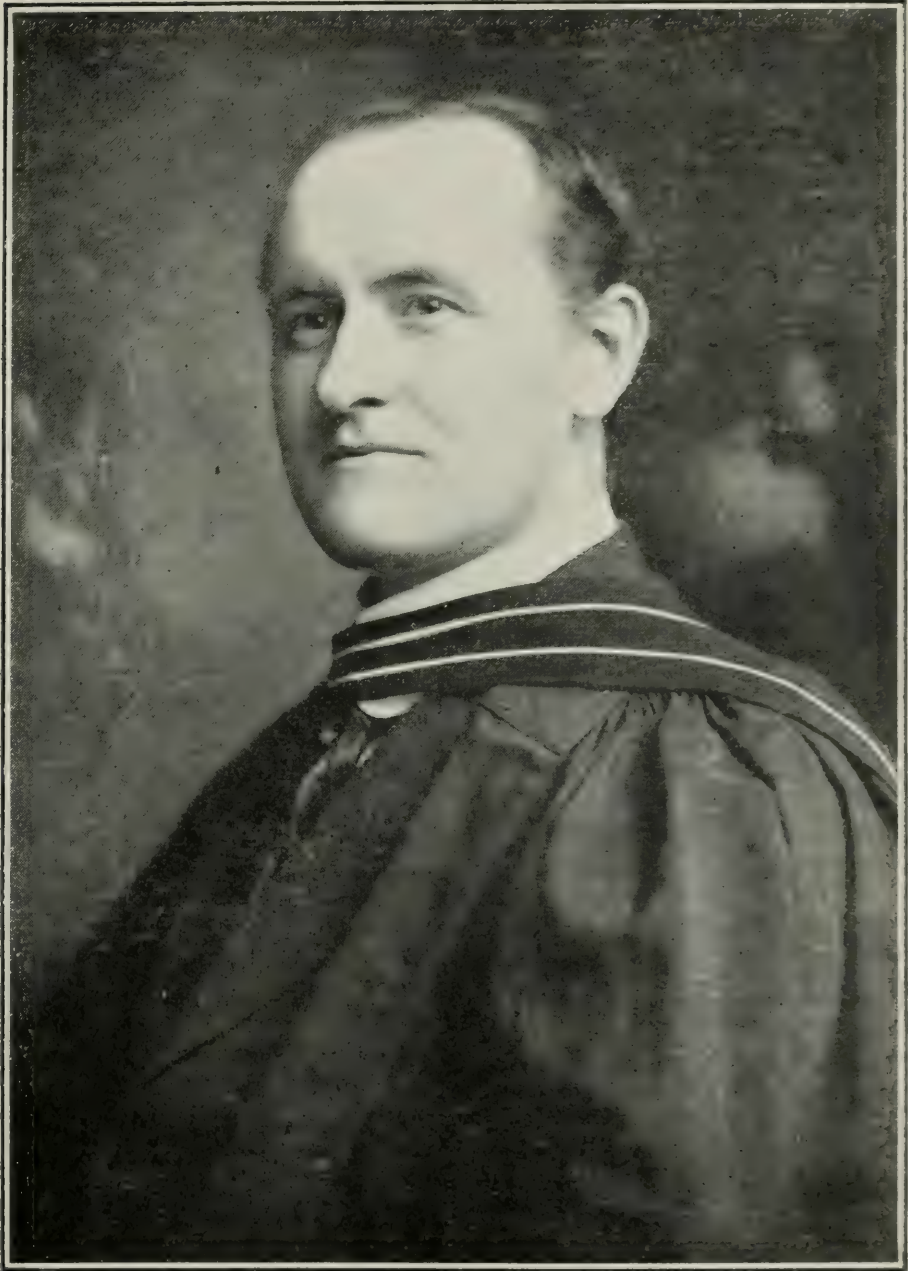
IN this article there has been collected in brief form some of the more important suggestions which were made by Dr. Cummer.

It is not possible to outline the course in detail, but the principles involved have been set forth as well as some of their practical applications.

According to our present knowledge of root canal work, and the fact that so many systemic lesions are traced to foci of infection about the roots of teeth (which latter we have often little or no success in eradicating) the indications point to more frequent extraction in doubtful cases. In order to replace these lost organs, bridge-work or partial removable denture work becomes necessary.

In fixed bridgework we again have root canal work to perform, which may lead to the same conditions, which necessitated, in the first place, the removal of the lost organ. Then again, we have placed in the mouth an appliance which cannot be removed and is more or less difficult to keep clean and hygienic. Hence it seems that in many of these cases, especially where there are several spaces where the teeth are to be replaced, partial removable dentures are indicated.

Partial dentures, as usually made, consist of a rubber or metal base, fitting close up around the natural teeth, flattening out and bruising the free margin of the gum, and sustained in place, perhaps, by ill-fitting clasps which impinge upon the soft tissues surrounding the necks of the teeth. This combination, by mechanical injury, and as a result of maintaining food debris in close contact with the most vulnerable part of the tooth, is probably one of the greatest producers



W. E. CUMMER, L.D.S., D.D.S.

of dental caries and pyorrhoea, and is constantly in a filthy condition.

The proper design for a partial denture consists of artificial teeth supported on a saddle, or saddles (preferably of gold), which are kept well away from the free margins of the gums surrounding the remaining natural teeth, and supported by the best means to which the case is adapted, whether clasps, split-pin attachments, or studs, etc. The piece should consist, preferably, of a skeleton framework (except in those cases where adhesion is a necessary adjunct to re-

tention), so designed that, at a future date, if necessary, parts may be added to it to replace a tooth which seems doubtful at present, but which it does not seem desirable to extract.

Removability is desirable, in order that the appliance may be kept clean. Also the appliance should be so designed as not to interfere with the slight natural movement of the teeth in their sockets. This so-called "Pumping Movement" aids in the circulation of blood in the tissues surrounding the tooth. Skeleton work aids in this on account of its springy character.

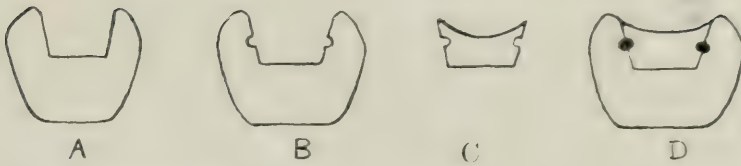
The greatest part of the strain of mastication should be placed upon the natural teeth remaining and not upon the mucosa. This, in many cases, can be secured by means of occlusal rests and will be explained later. Anatomical articulation is also a very necessary procedure in these cases.

Before proceeding to construct a piece of this nature, it is very necessary that all treatments of teeth are properly carried out. This may save the prosthetist considerable trouble later, for, should one of his abutments prove faulty, and later be lost, he may have to reconstruct the whole appliance.

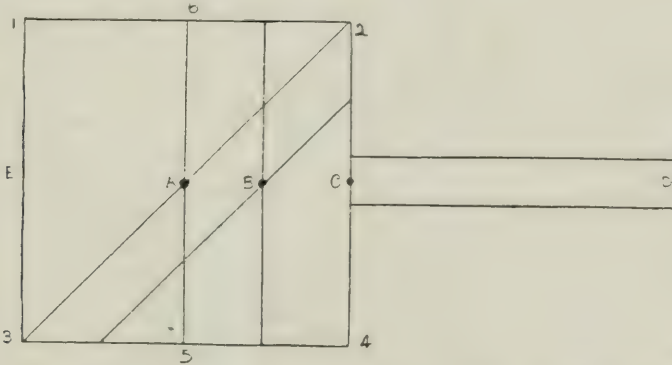
"Study models" should be carefully prepared and the conditions of the various cavities, loose teeth, character of saliva, etc., indicated upon the case history form. These constitute the "Blue prints" and from them the size, shape and retention of the denture is plotted out. The minimum cutting of tooth structure is desired. Hence, where we have a tooth without a cavity which is suitable for a clasp, we use a clasp. If there is caries, or an old filling, we may make an inlay or crown, as the case calls for, and use one of the other forms of attachment, such as the Roach, Gilmore, Chayes, etc. Inlays which are to hold retaining devices require to be well supported, and a few suggestions are here given. If a groove is cut in the walls of the inlay, at right angles to the direction in which it would leave the cavity, and a corresponding groove is made in the cavity itself, the cement, filling this double groove, will act as a great help in retention of the inlay.

Screw pins may also be used which are screwed in through previously drilled and tapped holes in the inlay, and which extend into the root canals or into holes prepared in the tooth structure. These screws should either diverge or converge so as to lock the inlay in place.

In making crowns, the use of a lingual half band (in those cases where the remaining lingual portion of the tooth structure is high enough to enable us to keep this band well away from the free margin of the gums), may be of great aid in resisting strain. It also is an aid in preventing the splitting of the root. In making up shell



A.—Cavity Preparation.
B. and C.—Grooves cut in cavity wall and in inlay.
D.—Inlay cemented in.



Appliance 1234 is stable when supported at both ends of lines passing through centre A.

Less stable if line passes through any other point as at B.

If supported only at 2 and 4 the rest of the appliance is free to move. If the indirect retainer C. D. is now added the point C. is in the centre of the new appliance, and it is again stable. The point D. on which the end of the retainer rests, should be as far as possible, from the line joining the two retention elements.

crowns or in securing a proper fit for one already made, Dr. Cummer gave his technique. Briefly, it is as follows:

An impression in compound is taken of the prepared root end, which, if necessary, has been built up with an inlay by pressing a softened portion of a stick of compound into a copper ring, which is slightly longer than the root and which is held in place by the hand. The Compound is thus forced into every detail and an accurate impression is the result. This impression may be reinforced by being imbedded in plaster, after which amalgam is tightly packed into it, allowed to set well and removed by clipping away the plaster and slightly warming the compound.

Around this amalgam model a band of pure gold 34-36 gauge, is pinched and burnished accurately to place. The tinsmith's joint is used to join the ends. This band is then trimmed so as to clear the gum margin by about 1 mm. A band of plate gold as used for shell crowns is next adapted to the model (keeping it away from the gums as above) and properly contoured and trimmed so as not to interfere with the occlusion. This is removed, waxed, placed in mouth, bite taken, and wax carved, and the occlusal surface is cast. It is then placed back on the model, forced down over the pure gold band, the two waxed together, removed and soldered with 22k. solder.

In making clasps, individual impressions should be taken in plaster, which should be broken away from the tooth, reassembled and filled with Mellotte's metal. After the clasps are made these metal models can be inserted, if desired, into the final impression and incorporated in the Spence's plaster cast. An impression tray for taking these impressions may be easily made of 17 gauge air chamber metal, which will easily come away, leaving the plaster free to be cut. They may be made by pinching the metal around a cone of wood or metal, say $\frac{3}{4}$ inch in diameter at one end and $\frac{1}{4}$ " at the other, and about 3" long. Tin foil patterns should be made by burnishing No. 60 tin foil over the cast, marking the outline of the clasp, smoothing out and cutting to the marks. This pattern is laid on the gold and the latter is cut, annealed, and adapted to the cast accurately. If the angle at which the piece of metal leaves the cast is noticed, and the pliers placed to correspond and the bend made along that line, the adapting of the clasp will be simplified. The curvature, due to the occluso-gingival convexity, may be obtained by use of contouring pliers, S.S.W. No. 112, curved, or similar. A small hammer is an aid in tapping down awkward corners.

Clasps owe their success more to the locking of their concave surfaces over the convex surfaces of the teeth than to "tenso-friction." Hence the teeth to be clasped should present opposing convex surfaces. Bicuspid, molars (viewed at right angles to a line joining the mesio-buccal and disto-lingual cusps on uppers), and in some cases cuspid teeth. The latter present a cingulum, opposed to the convex labial surface, and also a convexity over the contact points.

Clasps should be kept well away from the gums, and should be attached to the base with 14 gauge gold platinum wire soldered to the clasp and base (if latter is gold), or to the lingual bar. These wires should be kept in the lingual embrasures. Clasps should not be used on teeth with a pronounced buccal or lingual inclination, nor upon teeth with proximal fillings which would be beneath the clasp. They should engage both buccal and lingual surfaces and should extend about $\frac{3}{4}$ of the distance around the tooth. They should never be placed between two teeth in a space made by grinding one of the proximal surfaces.

Often a tooth to be clasped has moved slightly out of occlusion. This may be corrected by casting a piece to build up the occlusion and attaching it to the clasp. It should not, however, fit into the grooves and fissures, but only touch at enough points to be stable.

The force of adhesion, which in some designs is necessary, may be secured by taking accurate muscle trimmed, compound impressions by the Greene Supplee method. Compensation for the hard areas in the palate is necessary. These may be secured by metal lifts, placed on the cast corresponding to the area as plotted out.

Studs may be used as one of the retention elements. They are made to fit into a recess or a slot in an inlay or crown. Or short studs may be soldered to an inlay and a ring be made and attached to the denture which fits over the stud. They are made of No. 14 G.P. wire.

Roach attachments should be kept in the lingual embrasures, should be fairly well paralleled, and the tube should be attached to the base with a 14 gauge gold platinum wire soldered to it.

Gilmore attachments should not be used on a single tooth, as too much of a tipping stress is imposed. If two teeth are joined by a Gilmore wire, kept clear of the gums, the result will be much more satisfactory.

The principle of direct retention may be explained as follows: If we take a square piece of metal, find the centre of it, draw lines through the centre to the sides in all directions, namely, draw diagonals or join diametrically opposite points through the centre, and then place the metal on a table and hold it at both ends of any one of these lines, we will find it is held down at all portions. If, however, these lines pass through a spot not in the centre we find that, as this spot nears one of the sides, our retention is less stable, and, when the spot is on one of the sides, the other side is left free to move. This is where indirect retention is useful. If now, a piece of metal is attached to the original piece, so as to extend out beyond the edge a distance equal to the diameter of the original piece, our spot is now in the centre, in that direction of the new piece thus formed, and we have again secured stability. Hence appliances in the mouth should have their retaining devices diagonally opposite or directly opposite. If the line joining the two retaining devices passed through one side of the piece, an indirect retainer made of 14 gauge gold platinum wire should extend back or forward as the case demands, and rest on the occlusal surface of the tooth or in a slot in an inlay, to prevent tipping. For the application of these methods the reader is referred to Dr. Cummer's articles in March, April and June issues of Oral Health, 1916.

COURSE OF TWO LECTURES GIVEN BY ARTHUR HOPEWELL-SMITH, M.R.C.S., L.R.C.P., L.D.S.

HAROLD K. BOX, D.D.S., TORONTO.

AT the outset Dr. Hopewell-Smith referred to the importance of a greater understanding by the dental profession, as a whole, of the pathological changes which take place in and about the teeth. The first lecture covered the diseases of the dental pulp and peridental membrane, and the second, that of Tumors arising from the teeth and surrounding parts.

Introductory:—

The essayist described the dental pulp as a "Peripheral organ implanted in a peripheral environment, subjected to peripheral metamorphoses—through the unique vascular and nervous mechanism that it possesses—surrounded by dense, unyielding walls," in consequence of which it was particularly susceptible and predisposed to disease. Attention was drawn to the fact "That the osseous foundations of the teeth of man, being peripherally placed in the alveolar processes of the jaws, in which the diploetic bone is, at its margins, of poor construction and quality and feebly supplied with blood, are anatomically and histologically deficient in those properties that tend to a permanent condition of life."

Aetiology:—

The causes of diseases of the pulp were considered under two classifications, Predisposing and Exciting, and may be summarized as follows:—

A. Predisposing.

1. General.

(a) Physiological e.g.

I. Age—degenerations of various kinds become more and more common as the age increases.

II. Sex—It is very difficult to differentiate either macroscopically, or microscopically between teeth of the male and female sexes. It is believed that the pulps of the teeth of both sexes do really differ.

III. Hereditary—It is not definitely known to what extent the pulp suffers through transmission of susceptibility to the onset of morbid conditions, but in all probability it is very little.

(b) Pathological—Certain chronic diseases, acute general pyrexial or apyrexial maladies, anaemia, chlorosis, etc., may leave their marks on the life histories of the dental pulp.

2. Local—Anatomical peculiarities of hard and soft parts, etc. The great vascularity of the dental pulp, the delicate structure of the walls of the blood vessels and the semi fluid nature of the matrix, together with the small apical foramina which transmit the blood vessels, and the absence of collateral circulation, render the pulp susceptible to circulatory changes. The essayist believes that it is rare to find a normal pulp in a tooth of an European, Asiatic or American after the age of thirty years.

B. Exciting.

1. General—Endogenetic: Effects of disease of

- (a) Vascular System. "Anaemia, Chlorosis or other conditions due to alteration in the chemical constituents of the blood which may or may not lead to diseases of the vessel walls, or, elevation or depression of the blood-pressure in the pulp, belong to this group."
- (b) Nervous system: "Neurasthemia, hysteria or repeated undue excitability of the nervous system reacting locally, belong to this group."

2. Local—Exogenetic.

- (a) Apparent: Effects of dental caries. When infection of the dentinol tubules takes place changes are at once manifested in the dental pulp. "The first phases of the phenomena associated with breach of surface are concomitant with cellular activity; and a barrier to the bacterial incursions, composed of adventitious dentine conveniently classified as arcolor, cellular, fibrillar, hyaline and laminar, is thrown up on the pulp side as a rampart. The appearance of hyperaemic foci is the very next indication that the pulp is becoming affected by disease. There is a bacteriological irritation of the protoplasm in the dentinal tubes. The immediate effect of the invasion of the bacteria, therefore, is a toxic infection of the pulp, which endeavors to make an immediate effort to repel the attacks of the enemy."

- (b) Non-apparent—Effects of Thermal, chemical and other stimulations.

Great variations in temperature that the mouth frequently undergoes, exercise a harmful influence on the pulp. "The result of elevation or lowering of the temperature of the pulp is to act partly on the arterial supply and partly on the nervous system—heat, of course, producing vaso-dilation and a tendency to hyperaemia and pain; and cold producing vaso-constriction and anaemia and also pain."

Hyperaemia.

Modified by the peculiar environmental factors mentioned previously, pathological changes are observed in the pulp in exactly the same way as in other soft tissues. The nutrition of the pulp depends upon a normal regulation of the blood supply. Extremes of heat or cold produce alterations in the circulation of the pulp. A loss of normal covering of the pulp renders it susceptible to lesser extremes.

As stated by Dr. Hopewell-Smith, "Arterial hyperaemia may be brought about by any condition that either paralyses the vaso-constrictor nerves or stimulates the vaso-dilator nerves or weakens the tunica media or removes the extra vascular pressure. Venous hyperaemia or passive congestion occurs much more frequently than

arterial hyperaemia, and is due to an abnormal obstruction to the out-flow of blood from the veins of the pulp depending upon local conditions. The seat of obstruction is at the apical portion of the roots of the teeth where the mechanical pressure of hard dentinal walls, combined with the absence of collateral circulation, cause this development to the fullest degree." The microscopical changes in the pulp due to venous congestion were illustrated by beautiful lantern slides.

Inflammation.

Inflammation has been defined as the series of local adaptive changes in tissues that result from local or referred injury.

"Taking all things into consideration we may conclude that inflammation is a reaction to local injuries calling forth protective and reparative measures; but that it is an imperfect pathological adaptation often leading to consequences that are dangerous per se and defeat its purpose." Hektoen and Riesman.

The essayist pointed out that as this is true for the tissues in general so does it apply to the dental pulp in particular.

THE RETROGRESSIVE CHANGES IN THE PULP.

The pulp, on account of the unique nature of its circulatory apparatus is peculiarly liable to undergo degenerations. The essayist drew attention to the fact that many teeth in both old and young, apparently not affected by disease, reveal a condition known as fibroid degeneration, which he illustrated by enlarged micro-photographs on the screen. Dr. Hopewell-Smith considers this condition to be a natural old-age termination of the life of a healthy pulp.

Another pathological condition found in this organ is calcareous infiltration of the pulp. Pulps affected by calcification, examined microscopically, present the appearance in varying degree, of smooth, round, irregular nodules. The essayist has stated "There are usually pronounced clinical symptoms which come on after the enlargement of the nodules has produced some considerable pressure in the pulp cells and fibres. It is not known whether the actual pressure of the nodules on the nerve bundles in the immediate vicinity (thus producing a slight amount of nerve stretching) sets up pain and discomfort, or whether pain may be due to an increased volume of tissue in the pulp."

In Neuralgia, depending on dental causes, there are certain points of anatomical interest upon the head and face where the pain is of maximum intensity. Dr. Hopewell-Smith described the areas that are concerned with dental practice. He named them as follows:

1. Fronto-Nasal.
2. Naso-labial.
3. Temporal.
4. Maxillary.

5. Mandibular.
6. Mental.
7. Hyoid.
8. Superior Laryngeal.

The pathological conditions in the peridental membrane were taken up in detail in the second part of the first lecture.

The second lecture was also a very important and interesting one. The essayist chose for his subject, "Tumors of the Jaw of Dental Origin."

FIFTIETH ANNIVERSARY BANQUET.

CAPTAIN HARRY S. THOMPSON, C.A.D.C.

THE most enjoyable function of the Fiftieth Anniversary Meeting of the Ontario Dental Society, and the most successful in the history of the Association, was the banquet held at the Carls-Rite Hotel on Wednesday evening, May 23rd, 1917. In keeping with the times, it was decidedly patriotic in tone, and with the two principal speakers in khaki, and a goodly sprinkling of the members also wearing the King's uniform, the affair took on a decidedly military air. The presence of the ladies, with their beautiful gowns, the war time decorations, and a plentiful supply of cut flowers, coupled with a pleasing arrangement of the tables, produced a real scene of beauty, and at no convention of recent years has the fraternal spirit been more in evidence than at this banquet. Mr. C. H. Bodley's orchestra provided music during the evening and Miss Irene Symons, soprano, and Mr. Owen Smiley, elocutionist, were each heard in several selections which were heartily encored.

The President of the Society for 1916-17, Dr. N. A. R. Thomas of London, Ontario, presided and, after full justice had been done the "menu" he proposed the first toast of the evening, "The King," which was responded to by singing the National Anthem and the Maple Leaf Forever. Following this toast the Chairman, in a happy speech, referred to the pleasure it was for him to preside at such a meeting, and took the opportunity to thank the members of the Society for the support they had given him during the year. In a humorous way he referred to events that happened during his term of office, and heartily congratulated the different committees for their excellent work, which had brought about this most successful convention. Dr. Thomas read telegrams from Sir A. E. Kemp, Col. Mewburn and Mr. A. Claude Macdonald, M.P., expressing their regrets at not being present.

Mrs. A. E. Webster, Toronto, was then called upon, and briefly explained the organization and purpose of the Ladies Auxiliary of the C.A.D.C. Mrs. Webster said that the Auxiliary had been

formed to collect and raise money to supply comforts to the men and N.C.O.'s of the Army Dental Corps, and to look after their wives and children should any case of necessity arise. On the departure for overseas of the last draft, the men had each been given a parcel of comforts and were assured by the Officers of the Auxiliary that if they needed anything, not supplied in the regular issue, the Ladies would endeavor to get it for them. Mrs. Webster suggested that any ladies from the towns outside of Toronto, who were interested in the work, could join this auxiliary or, if there were enough of them in their own town, they might form a branch of their own, and carry on the same kind of work. The speaker impressed upon everyone present how easy it is to get help in this work, everyone seeming anxious to help any and all of our boys at the front—and the need truly is great.

The second toast, "Our Men in Khaki," was proposed by Dr. A. W. Thornton, Dean Dental Department, McGill University, Montreal. In his forceful and eloquent style he spoke of the pleasure it was for him to be present, and referred to the kindly treatment he had always received from the profession during his twenty-five years residence in Ontario. Dr. Thornton referred to the great work being done by the Canadian Army Dental Corps, both in Canada and overseas, and spoke from personal knowledge of the work being done at the front. He cited many instances of the improved physical condition of our soldiers, after having their mouth conditions restored to normal by our own Dental Corps. He especially referred to work that he had seen done in No. 4 Base Hospital by Lt.-Col. George Gow and Capt. Fred Mallory of Toronto, and spoke of one particular case that had come to his notice: of a young soldier suffering from Trench Mouth, whose oral cavity had been put in healthy condition again, and out of gratitude the boy's father had presented the Corps with a motor ambulance. He also paid tribute to General Logie for the assistance and support he had given the C. A. D. C. here in Canada, and particularly in M. D. No. 2, and said "That with the support of such men as General Logie and our own A.D.D.S., Major W. G. Thompson, the work would go on to still greater success." Dr. Thornton, who has had the privilege of a visit to the front trenches, told of the hardships and suffering that he had seen, and gave many instances of heroic sacrifices, but assured his hearers, that through it all, comes the happiness of having served one's country and of looking forward to the glorious end. The speaker referred to the noble work being done by the women in this war, and rejoiced that they were being recognized by the granting of the franchise, and in being given a voice in the affairs of the Empire. In closing his remarks the speaker paid a tribute to Canada and eloquently emphasized the fact that the

most important toast we could honor to-day is to our "Men in Khaki."

Major-General Logie, in responding to this Toast, was greeted with a great reception, the members rising to their feet and with waving of handkerchiefs gave "three cheers and a tiger," followed by "For He's A Jolly Good Fellow." General Logie expressed his pleasure at being present and spoke of the excellent work of the Army Dental Corps and what it had done in fitting men for active service. While he could not state the present number of men that had been made ready for the front by this Corps, he said that up to last summer, June, 1916, something like 16,000 men had been rendered fit for service who never would have otherwise reached the front had it not been for the Army Dentists. He spoke of the great work being done by the Corps in this particular district, and congratulated Major W. G. Thompson on his organization, and on the ability of the men he had chosen to work with him. He realized the great sacrifice these men had made in giving up their practices, and regretted that they had not, as a unit, received the proper recognition, but hoped that before long this matter would be brought before the powers that be, and the Corps would get the rank and pay they deserve. General Logie then reviewed the work done in Military District No. 2 from a purely military standpoint. He said that fifty-seven battalions had gone overseas from this division, and a great many of them had made lasting names for themselves on the firing line. He made special reference to the Commanding Officers of each battalion which was very interesting, as each one mentioned was of personal interest to some one in the assembly. The speaker closed his remarks with best wishes for the Society and the C.A.D. C., and promising to use his best efforts on their behalf.

The second speaker to respond to this toast, "The Men in Khaki," was Captain W. A. Cameron, who has but recently returned from the front to assist in a great Canada-wide Y.M.C.A. Campaign. Capt. Cameron, in terms eulogistic, paid high tribute to the character, worth and glorious achievements of the boys on the firing line. "They do not hesitate," he said. "They were not deaf when the call came, and a high seriousness has surged them. They fully realize the grave issues that have been given to their care. These eighteen-year-old lads have with one sweep been swept into manhood and to the full responsibility of the work in which they are engaged." The speaker portrayed, with great effect, the temperament, characteristics, and actions of the soldier at the front and said that "At times he is a laughing, frolicking, sport-loving boy, singing inane ditties maybe as he marches along but when the test comes he is silent, serious and prepared to give his life, rejoicing in the fact that he is doing God's work." Captain Cameron's soul in-

spiring speech was greeted with tumultuous applause, and the banquet was brought to a close by singing "Auld Lang Syne."

Sitting at the head table as guests were: Dr. Ross Thomas, Chairman; Major General Logie, Capt. (Rev.) W. A. Cameron, Dr. A. W. Thornton, Mrs. J. B. Willmott, Hon. I. B. Lucas, Mrs. Lucas, Major W. G. Thompson, Dr. R. G. McLaughlin, Dr. Wallace Seccombe, Mrs. Seccombe, Dr. Harold Clark, Mrs. Clark, Dr. A. E. Webster, Mrs. Webster, Dr. C. A. Kennedy, Dr. F. C. Husband, Mrs. Husband, Dr. Arthur Ellis, Mrs. Ellis, Dr. Walton Ball, Mrs. Ball, Dr. A. J. Broughton, Mrs. Broughton, Dr. W. B. T. Amy, Mrs. Amy, Dr. E. F. Arnold, Mrs. Arnold.

The Banquet Committee was composed of the following: Drs. R. G. McLaughlin (Chairman), John E. Rhind, Arthur W. Ellis, C. A. Kennedy, Wallace Seccombe.

ENTERTAINMENT OF VISITING LADIES.

MRS. F. C. HUSBAND, TORONTO.

THE wives of the out of town delegates, to the 50th Annual Convention of the Ontario Dental Society, were entertained by a Ladies' Committee during the convention week.

On Tuesday afternoon a reception was held in the Blue Room of the I.O.O.F. Building, to which the gentlemen were invited. Music and refreshments added to the pleasure of the entertainment.

On Wednesday morning the visitors went in a party to the Royal Ontario Museum and in the evening were the guests of the Society at a Banquet at the Carls-Rite Hotel. The dinner was followed by a delightful program, to which Miss Irene Symons and Mr. Owen A. Smiley contributed, and a Military Toast drew stirring addresses from Dr. A. W. Thornton, General Logie and Capt. W. A. Cameron.

On Friday afternoon the Ladies completed the entertainment of their guests with a Motor trip around the city, stopping off en route, to inspect the Military Base Hospital, the College Street Military Hospital, and the Spadina Ave. Military Hospital.

ONTARIO DENTAL SOCIETY LUNCHEON.

HAROLD CLARK, D.D.S., TORONTO.

ON Tuesday, May 22nd, two hundred and fifty of the members of the Ontario Dental Society sat down to a Luncheon at the Central Y.M.C.A., with Sir Sam Hughes as guest of honor.

At the head table were seated with President Thomas, Sir Sam

Hughes, Majors Thompson and Roberts, Dr. Thornton, Dr. Rhind and Dr. Orton.

After luncheon the President introduced Sir Sam Hughes. He was received by the members with three hearty cheers. In his remarks he outlined in a very practical and intelligent way the value of the dentist to the army, referring to personal experiences to show how completely undone and useless the best soldier may become when suffering with his teeth.

Sir Sam paid a high compliment to the splendid work done by the civilian dentists early in the war, who organized themselves into a voluntary corps to make healthy the mouths of men who had been rejected on account of defective teeth, and to assist the regular Dental Corps in the colossal task of putting in order the mouths of men already enlisted. Sir Sam expressed his gratification in the part he had taken in the organization of the Canadian Army Dental Corps and referred to the opposition of some of the Army Medical Corps to the formation of a Dental Corps outside of their control. He said this war was a struggle between autocracy and democracy and, humorously, likened the attitude of some members of the Army Medical Corps to the dying cause of the Central Powers of Europe.

The speaker, seeing several of his old high school pupils in the room, referred to his teaching days. He said that he always tried to develop a sturdy, independent spirit in his boys, and that the war that is going on to-day is showing that the most valuable characteristic of the Canadian soldier is his individual initiative and dash. He illustrated the point by a reference to a recent episode at the front where, after the big drive had pushed the Germans back, it was expected that a whole month would be required to bring up the guns, etc. "Jack Stewart told General Haig that, with a couple of battalions of Canadian Pioneers, it could be done in two weeks. It took just four days."

Lieut. W. E. Willmott moved a vote of thanks to Sir Sam, which was seconded by Dr. Thornton. The meeting closed amid cheers for the guest of the occasion.

DR. CUMMER—PRESENTATION.

OWING to the unfortunate and much regretted absence of Dr. C. N. Johnson, Dr. W. E. Cummer was called upon to occupy more time during the Convention than had been originally planned by the Committee. The members of the Convention so appreciated Dr. Cummer's effort, particularly under the circumstances, that a purse of \$300.00 in gold was presented Dr. Cummer as a slight token of esteem and evidence of the Convention's sincere appre-

ciation. The purse was presented by Drs. A. W. Thornton and Harold Clark, with the suggestion that the amount be used for a telescope, it being understood that Dr. Cummer had, at some previous time, expressed a desire to possess such an instrument. Dr. Thornton suggested that, as the recipient had explored the mechanical mysteries of this world, he might now turn his attention to the realm of the celestial. In reply Dr. Cummer expressed the view that even with a telescope he could not hope to get as "near" heaven as he "felt" at that moment, surrounded as he was by many friends, expressing their kindly feeling toward him.

REPORT REGARDING CANADIAN ARMY DENTAL CORPS ESTABLISHMENT.

FRED J. CONBOY, D.D.S., TORONTO.

DR. WALLACE SECCOMBE and Dr. Fred J. Conboy were deputed by the Royal College of Dental Surgeons to discuss with the Minister of Militia, several matters in regard to the relationship of our profession to its military responsibility. The appointment of this deputation, for the purpose named, was endorsed by the Ontario Dental Association, so that the committee, while in Ottawa, were permitted to speak as the representatives of both of these important bodies.

As the result of the interview with Sir Edward Kemp and the heads of several of the branches in his department, an instruction was sent to Lt.-Col. Clayton to prepare and present to the Militia Council a proper and adequate establishment for the Canadian Army Dental Corps. When this establishment is approved by the Militia Council, a general order will be issued covering it, thus placing the Dental Corps on an independent and permanent basis. The military authorities felt that it would be impossible at the present time to decide what the establishment should be in times of peace, as they had no knowledge of the conditions which might exist at that time in regard to our permanent militia forces, but a clause will be inserted in the general order to the effect that the peace establishment as an independent corps, shall be decided immediately at the conclusion of the war.

BRITISH COLUMBIA AND THE DOMINION DENTAL COUNCIL.

DR. H. R. ABBOTT reported to the Convention the receipt of a telegram from British Columbia, stating that the B. C. Legislature has granted the request of the British Columbia Dentists, to incorporate in the new Dental Act, authorization to accept cer-

tificates issued by the Dominion Dental Council. Dr. Abbott referred to the very opportune visit of Dr. Seccombe to British Columbia and the Convention expressed its most hearty approval.

The Ontario Dentists, assembled in Convention, sincerely welcomed the British Columbia Dentists into the Dominion Dental Council.

ADVISORY COMMITTEE IN CASES OF ALLEGED MALPRACTICE.

DR. R. G. McLAUGHLIN introduced the subject of forming a Committee to act in an advisory capacity to members of the profession, in cases of alleged malpractice. The Convention adopted the plan and appointed the following committee with power to act: Drs. R. G. McLaughlin, Conboy, Mason, Webster and Seccombe.

VOTE OF THANKS TO PROGRAMME COMMITTEE.

A VOTE of thanks to the members of the Programme Committee was moved, seconded and carried, amid applause. Dr. W. E. Willmott, the Chairman, responded on behalf of the Committee and thanked the members for their attendance and cordial co-operation.

INVITATION FROM HAMILTON.

AN invitation from the Board of Trade of the City of Hamilton was presented, urging that the next meeting of the Ontario Dental Society be held in that city. The matter was referred to the Executive Committee for attention.

The President's address was also referred to the new Executive for action.

OFFICERS ELECTED FOR COMING YEAR.

Hon. President—G. S. Caesar.

President—J. P. Simpson, Trenton.

Vice-Presidents—Presidents of All Local Societies.

Treasurer—J. E. Rhind.

Secretary—J. A. Bothwell.

Programme Com.—Chas. Scott (Convenor). H. A. McKim, J. P. MacLachlan, I. H. Ante, T. F. C. Butler.

Oral Hygiene Com.—Drs. Coyne, E. Eaton, Conboy, Husband.

NAMES OF THOSE IN ATTENDANCE.

THE following members of the profession registered for the Fiftieth Anniversary Meeting of the Ontario Dental Society:—

- | | |
|-----------------------------------|-------------------------------------|
| Drs. D. G. P. Allan, Mount Forest | H. A. Blatchford, Fort William. |
| H. C. Arnott, Oshawa, Ont | William Burnet, Galt. |
| W. J. Armstrong, Iroquois. | E. A. Campbell, Orangeville. |
| A. H. Allen, Paislev. | C. H. Clarkson, Toronto. |
| R. M. Armstrong, Ottawa. | H. O. Crane, Toronto. |
| W. Allan Armstrong, Ottawa. | Hugh Cunningham, Toronto. |
| J. W. Armstrong, Toronto. | B. J. Curry, Winnipeg, Man. |
| J. M. Abbott, Erin. | Frederick J. Capon, Toronto. |
| C. N. Abbott, London. | E. H. Cosgrove, Ottawa. |
| J. Frank Adams, Toronto. | C. G. Chapin, Timmins, Ont. |
| H. W. Anderson, Toronto. | Fred. J. Conboy, Toronto. |
| G. A. Adams, Toronto. | C. R. Collard, Toronto. |
| E. F. Arnold, Toronto. | H. L. Cheney, Alexandria. |
| Irwin H. Ante, Toronto. | J. J. Craig, Bowmanville. |
| W. B. Amy, Toronto. | O. W. Canning, Toronto. |
| J. Elmer Amos, Brantford. | G. J. Clint, Winnipeg, Man. |
| H. R. Abbott, London. | Wm. L. Chalmers, Alexandria, Ont. |
| W. A. Ashlev, Napanee. | J. S. Chambers, Toronto. |
| E. C. Abbott, Toronto. | J. C. C. Crawford, Haileybury. |
| H. H. Armstrong, Toronto. | Jas. W. Coram, Toronto. |
| J. H. Atkins, Toronto. | J. P. Collins, Buffalo, N.Y. |
| J. L. Anderson, Oakville. | R. H. Cowen, Hamilton. |
| D. Baird, Toronto. | W. H. Coon, Toronto. |
| J. C. Bansley, Toronto. | T. A. Currie, Toronto. |
| W. A. Black, Toronto. | M. J. Clarke, Belleville. |
| L. F. Boyle, Toronto. | A. L. Crozier, Brighton. |
| E. S. Barker, Stouffville, Ont. | T. F. Campbell, Galt. |
| A. J. Broughton, Toronto. | J. M. Cation, Toronto. |
| Garnet Britton, Guelph, Ont. | Harold Clark, Toronto. |
| D. H. Beaton, Toronto. | O. S. Clappison, Hamilton. |
| E. S. Ball, Toronto. | W. B. Cavanagh, Cornwall. |
| A. E. Benson, Essex, Ont. | N. S. Coyne, Toronto. |
| C. B. Bell, Toronto. | F. E. Crysler, Niagara-on-the-Lake. |
| E. E. Bruce, Kincardine, Ont. | W. A. Cowan, Toronto. |
| W. H. Walton Ball, Toronto. | Geo. H. Cowan, Toronto. |
| F. Barron, Paris, Ont. | P. S. Day, Harrowsmith. |
| Clarence E. Brooks, Toronto. | C. J. Devine, Beaverton. |
| T. E. C. Butler, Toronto. | J. M. Deans, Wingham. |
| W. A. Brownlee, Grimsby, Ont. | M. A. Day, Belleville. |
| Harold K. Box, Toronto. | D. R. Davidson, Frederickton, N.B. |
| B. W. Bracken, Bolton. | J. A. Dean, Kenora. |
| J. W. E. Brown, Peterboro. | D. Davidson, Woodstock. |
| J. Ames A. Brett, Toronto. | H. O. Dewar, Toronto. |
| T. A. Bell, Harriston. | Jas. Duncan, Galt. |
| Chas. O. Beam, St. Catharines. | E. A. Dolson, Toronto. |
| John A. Bothwell, Toronto. | Frank L. Dayment, Toronto. |
| A. C. Burnet, Hamilton. | J. A. Drummond, Petrolia. |
| H. J. M. Bannerman, Owen Sound. | Arthur Day, Toronto. |
| M. R. Billings, Cayuga. | W. A. Dalrymple, Toronto. |
| J. S. Brookes, Gore Bay. | J. C. Dewitt, Bowmanville. |
| W. N. Brown, Toronto. | W. F. Elliott, Toronto. |
| E. P. Bier, Toronto. | Geo. W. Everett, Hamilton. |
| J. W. Barker, Cannington. | George Emmett, Toronto. |

Arthur W. Ellis, Toronto.
 H. E. Eaton, Toronto.
 H. L. Elliott, Copper Cliff.
 G. A. Elliott, Brantford.
 G. E. French, Niagara Falls.
 E. W. Fuller, London.
 G. Vernon Fisk, Toronto.
 W. A. Fleming, Alliston.
 K. W. S. French, Amherstburg.
 Dr. Freeman, Beamsville.
 B. O. Fife, Toronto.
 R. P. Field, Owen Sound.
 Grant Fraser, Madoc.
 Selby E. Foster, Wiarton.
 L. L. Follick, St. Marys.
 J. F. Grant, Durham.
 W. T. Griffin, Hamilton.
 J. H. Greenfield, Winnipeg, Man.
 J. W. Gray, Hamilton.
 E. L. Gausby, Toronto.
 G. F. Gibson, Campbellford.
 S. B. Gray, Toronto.
 M. F. Ganton, Uxbridge.
 W. H. Graham, Ottawa.
 G. F. Gilroy, Toronto.
 George Hicks, Watford.
 W. T. Holloway, Peterboro.
 John Hutchison, London.
 E. Hart, Brantford.
 Arthur H. Hill, Dundas.
 Russell W. Hoffman, Toronto.
 S. H. Hutt, Chesterville.
 E. R. Howes, Brandon, Man.
 E. J. Howe, St. Catharines.
 George N. Howden, Watford.
 E. A. Higley, Chatham.
 Alfred A. Hicks, Chatham.
 W. J. Hill, Alliston.
 S. J. Hughes, Owen Sound.
 H. M. Hartman, Meaford.
 G. H. Holmes, Owen Sound.
 E. A. Hill, Sudbury.
 F. L. Henry, Oshawa.
 R. R. Harvie, Midland.
 H. Holmes, Toronto.
 T. C. Husband, Toronto.
 J. A. Hilliard, Kitchener.
 A. J. Irwin, Wingham.
 S. S. Ionson, Port Rowan.
 H. Irving, Lindsay.
 J. H. Irwin, Collingwood.
 J. G. Ireland, Harriston.
 R. D. Jarvis, London.
 Geo. G. Jordan, Toronto.
 H. B. James, Oshawa.
 F. H. Jones, Toronto.
 J. E. Johnston, Hamilton.
 A. Jemison, Millbrooke.
 C. A. Kennedy, Toronto.
 C. T. Kennedy, St. Thomas.
 S. M. Kennedy, London.
 A. E. Knapp, Kingston.

H. F. Klopp, Toronto.
 G. W. Krueger, Toronto.
 H. F. Kinsman, Sarnia.
 F. G. Law, Toronto.
 A. V. Lester, Hamilton.
 Jno. J. Leacy, Ottawa.
 J. A. Locheed, Hamilton.
 G. A. Liscomb, Drayton.
 W. A. Loveridge, Toronto.
 H. Loucks, Meaford.
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 W. E. Lundy, Toronto.
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 H. C. McClean, Milton.
 James O. McCutcheon, Toronto.
 W. S. McKay, Galt.
 G. C. McKinlay, Toronto.
 H. G. MacDonell, Goderich.
 R. G. McLaughlin, Toronto.
 C. S. McComb, Port Arthur.
 J. P. McLachlan, Toronto.
 R. I. McDonald, Hamilton.
 J. A. McTaggart, Blyth.
 R. J. McGahey, Toronto.
 H. A. McKim, Toronto.
 Andrew J. McDonagh, Toronto.
 T. N. McGill, Toronto.
 G. H. McKeown, Winchester.
 R. Macfarlane, Kitchener.
 R. A. McCormack, Barrie.
 J. H. McCullough, Perth.
 K. M. McVey, Toronto.
 R. McGill, Mitchell.
 A. D. A. Mason, Toronto.
 M. A. Morrison, Peterboro.
 J. M. Mitchell, Collingwood.
 W. S. Madill, Toronto.
 A. T. Morrow, Maxville.
 A. W. Minns, Fergus.
 H. M. Morrow, Hamilton.
 H. J. Murphy, Toronto.
 F. P. Moore, Hamilton.
 W. A. Matheson, Toronto.
 T. M. Mabee, Goderich.
 W. E. Morgan, North Bay.
 H. C. Marsh, Shelburne.
 Arthur H. Mabee, Gananoque.
 J. E. Middleton, Peterboro.
 D. R. Nethercott, Stratford.
 J. F. O'Flynn, St. Catharines.
 G. W. Payne, Vermilion, Alta.
 G. L. Palmer, Toronto.
 F. D. Price, Toronto.
 W. C. Pickering, Durham.
 R. A. Patterson, Kempenville.
 C. E. Pearson, Toronto.
 M. Pivnick, Toronto.
 J. M. Palmer, Toronto.

- T. F. Perkin, Grand Valley.
 G. C. Phillips, Toronto.
 Edgar W. Paul, Toronto.
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 R. D. Thornton, Toronto.
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MULTUM IN PARVO

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HELPFUL PRACTICAL SUGGESTIONS FOR PUBLICATION, SENT IN BY MEMBERS OF THE PROFESSION, WILL BE APPRECIATED BY THIS DEPARTMENT

NOTES OF DR. W. E. CUMMER'S LECTURES.

BY C. H. CLARKSON, D.D.S., TORONTO.

—All clasps and prosthetic appliances should be clear of the gingivae.

—Should as far as possible permit of normal movability of teeth and thus prolong normal health of teeth.

—Clasps should be so constructed as to bear part of the stress of mastication and thus relieve the mucosa.

—Study models, sketches, etc., are of great assistance in planning any work.

—Properly constructed clasps are often superior to Roach and other attachments and involve minimum cutting of tooth tissue.

—To secure proper models of teeth to be clasped, individual or separate impressions of those teeth are essential.

—Construct clasps so as to grasp opposite convex surfaces. Thus even cuspids make ideal teeth to use for this purpose.

—To avoid pulp destruction, interlocking grooves and pins in inlays are indicated.

—In constructing *splints* remember that those which are triangular or rectangular in form are more rigid than those following straight lines.

—Lock screws should be used for loosest teeth in splints.

—No. 60 tin foil is suitable for making pattern of clasp on individual model.

—Cast clasps are indicated in very short teeth.

—When walls of tooth are parallel line, clasp with pure gold for better grip.

—The application of 14 gauge platinum and gold wire to suitable teeth and grooves farthest from the primary attachment gives indirect retention, which is often the secret of proper stability.

—All restorations should be kept under observation

NOTES OF DR. ORTON'S PAPER.

BY C. A. KENNEDY, D.D.S., TORONTO.

—Some dentists do not like to cut down a tooth to put on a crown, but we cannot do all our adjusting from one jaw. We must take care of the forward movement as well as the lateral.

—I never attempt to cure pyorrhoea without getting at the cause.

—It is the incline planes of the cusps and not the few humps soldered on which do the masticating.

—A band should go as far gingivally as the gingivae line of a tooth, to replace the enamel cleaned off from the contour of a tooth.

—The measurement of a tooth at the enamel should equal the measurement at the gingivae marginal ridge, after the enamel has been cleaned off.

—On grinding down a tooth with a stone always use water as hot as patient can stand to avoid causing heat.

—In mounting a stone on a mandril, always fill hole in stone with vaseline, so as to keep out the moisture and stop rusting.

TO MAKE WAX ADHERE TO A METAL SURFACE.—Heat the metal surface to the melting point of the wax. Smear the surface with wax, using the heat from the metal to melt the wax. Wax flown upon metal surfaces in this way will not break away as easily as if flown upon a cold surface.—*W. E. Cummer, D.D.S., Per I. H. Ante.*

ATTACHING ROACH ATTACHMENT (BALL) TO AN INLAY.—With a round headed bur, drill a hole in the inlay about 2 mm. deep; place a piece of solder in this hole; insert the Roach Attachment into the hole; and heat the inlay with the flame from the blow pipe until the solder melts. At the same time press the attachment into place.—*I. H. Ante, D.D.S.*

HOW TO SECURE A CORRECT LATERAL MOVEMENT OF MANDIBLE.—When a patient is requested to chew on a wax model, the movements of the jaw are conscious movements and will be almost certain to indulge in a wider range of movement than is normal. On the other hand, if the root or gums are sensitive, the patient consciously or unconsciously will favor that particular area. Ask the patient to “grit the teeth” from side to side, you will avoid calling attention to any particular tooth or area.—*F. H. Orton, D.D.S., Per I. H. Ante.*

ORAL HEALTH

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Vol. VII.

TORONTO, JUNE, 1917

No. 6

EDITORIAL

The Recent Post-Graduate Course of the Ontario Dental Society

THE 1917 meeting of the Ontario Dental Society is now a matter of history and the question which naturally arises and which is being asked by the Committee and many outsiders is, "Has the gathering been a success?"

It was a new departure, a real break-away from the old style convention of written papers, discussions and clinics, and it was not without considerable hesitation that those responsible decided to undertake the larger and more expensive plan of the straight lecture or teaching course to be given by outstanding specialists. It was a bold stroke and required courage as well as confidence in the good judgment and stability of the dental profession of the Province.

That this judgment was warranted and that the confidence was not misplaced was clearly indicated by the large attendance and the many expressions of satisfaction and approval that were volunteered by members as the lectures proceeded.

The total attendance, not including the ladies, was almost up to the four hundred mark and we feel satisfied that, had the profession fully realized the value of this course to them in their daily prac-

tice, that number would have been easily doubled. It was a rare privilege even to meet those splendid men who took the course of lectures, to shake hands with them in friendly greeting, and to watch them as they talked and gave of their best to the audience. One soon discovered that their wonderful grasp and knowledge of the subject in hand "was not attained by sudden flight but they, while their companions slept, were toiling upward in the night." What an inspiration it was to listen to the eloquent Dr. Rhein plead for, and demonstrate how to attain, more adequate root canal work! Ideals he had and these ideals he left with us and we, assuredly, go back to our offices better equipped to perform this most delicate and important surgical operation. Also Dr. Orton, on the details of Crown and Bridgework, and Dr. Hopewell-Smith, on the Pathology of the Dental Organs, were most interesting and instructive.

The only real disappointment was the unavoidable absence of Dr. C. N. Johnson, owing to illness in his family. However, the sting of this disappointment was materially lessened by the offer of Dr. W. E. Cummer to step into the breach at the last moment. Dr. Cummer contributed four full lectures of one and a half hours each to the course, and was listened to with unabated interest to the very last.

From a friendly and social standpoint the gathering has been pronounced the best. The wives of outside dentists came in greater numbers than on former occasions and were entertained by the Toronto ladies, under the direction of the Ladies Committee in charge.

The dinner given at the Carls-Rite Hotel on the evening of the 23rd, was a most enjoyable function. About three hundred members with their lady friends were seated at the tables.

Altogether the 1917 meeting may be pronounced a success. The forward step has been fully justified and the Committee for next year may feel perfectly safe in following the same course of action. Ontario dentists have had a taste of better things and will not be satisfied to go back to the old style convention.

From Toronto to Victoria

THE Editor recently returned from a trip through the Canadian West, undertaken in the interests of Public School dentistry and as representative of the Royal College of Dental Surgeons of Ontario. The cities of Chicago, Minneapolis and St. Paul were first visited, and a careful study made of the plan of organization and work undertaken in oral hygiene in behalf of the boys and girls of school age at these points. The cities of Winnipeg, Regina, Calgary and Vancouver are all working at the solution of the dental problem as it affects the school child, and in each of the latter three cities a dental officer is employed by the school authorities.

DENTALS WIN HOCKEY CHAMPIONSHIP.

NO formal introduction to the people of Winnipeg was required by a "Dental" from Toronto at the particular time of this visit. The Dental hockey team was being freely discussed by "the man on the street." It was only necessary to say "Dental—Toronto," and even the proverbial small boy gave a knowing look and took the rest for granted. It was found to be quite a hopeless task for the writer to convince Winnipeg friends that the main purpose of his Western trip was *not* to witness the final games for the Canadian Amateur Hockey Championship. But the games were enjoyed none the less, and what wonderful games they were, and what generous acclaim was given the winners when those thoroughbred young dental colts travelled triumphantly the "rough and rocky passage," and emerged victors and holders of the Allan Cup! Youth, grit, good generalship, and clear sportsmanship each played their part in the victory, and notwithstanding the necessity for four strenuous games in the space of eight days, the dental boys had a grand time, and enjoyed every hour of their stay in Winnipeg city.

BRITISH COLUMBIA TO ENTER THE DOMINION
DENTAL COUNCIL.

THE writer had been invited to address the Vancouver Dental Society upon the subject of Preventive Dentistry, but it was subsequently agreed that the meeting should be devoted to a heart-to-heart discussion of British Columbia's relationship to the Dominion Dental Council. The local situation made the time particularly opportune for a frank discussion of the whole subject. British Columbia dentists have never really desired to hold themselves apart from the other Western provinces, but have felt that certain conditions obtain in British Columbia which have not always been fully appreciated outside the province, and the fear of a lack of sympathetic consideration of British Columbia questions doubtless deterred their entrance into the D.D.C.

The war has wrought wondrous changes in the Dominion of Canada, not the least of which is the development of a more rugged Canadian national sentiment. The result has been a growing spirit of mutual confidence among Canadians and a much better understanding of one another. It was doubtless this spirit more than any other single factor that led the British Columbia dentists to unanimously take an affirmative stand regarding the D.D.C. Subsequently the British Columbia Board passed a favorable resolution, and the plan will therefore become operative upon legislative assent.

British Columbia has taken her stand in the interests of Canadian dentistry, and it now remains for the dentists of the other provinces to reciprocate in every way possible. It would be a gracious thing

for the Canadian Dental Association to accept the invitation of British Columbia and hold the next meeting of the Canadian Dental Association in Vancouver. A cordial invitation has been forwarded to the president and secretary of the C.D.A. on behalf of the British Columbia dentists, and it is to be hoped that the dentists of Canada may soon have the opportunity of visiting in a body the beautiful city of Vancouver and learning something of the goodfellowship that is freely extended to visiting members of the dental fraternity by their confreres beyond the Rockies.

Had the Vancouver meeting been the only one attended, the writer would feel his trip to the coast amply repaid. It is at such times that one gets a clearer insight into the deeper feelings of true Canadians and renewed inspiration to work unceasingly for the more helpful co-operation of all the provinces of Canada, in the development and maintenance of the highest type of Canadian dentistry. It was worth a great deal to have been present at such an important gathering and to have been of some slight service in answering many questions relating to the D.D.C. The writer was able to assure the British Columbia dentists of the cordial feeling of the members of the Dominion Dental Council, and of the desire of the Council to co-operate in every possible way with British Columbia.

A PERSONAL WORD OF APPRECIATION.

THE dental societies, dental clubs and dentists who so generously entertained the writer during his journey to the coast are asked to accept this personal expression of gratitude and esteem. Nothing but goodfellowship was met at every turn. It is impossible, unfortunately, to make personal acknowledgement of so many kindnesses, and advantage therefore is taken of the present opportunity for the expression to each and all of most sincere thanks and appreciation.

Major Corrigan Wounded

WE regret to report that Major C. A. Corrigan, who received the Distinguished Service Order some months ago, has been wounded in the hip and hand. Mrs. Corrigan has been serving during the past two years as a nurse in France and is now with Dr. Corrigan. We are glad to say that Major Corrigan is progressing very favorably.

Dr. J. M. Mitchell Elected

DR. J. M. MITCHELL, Collingwood, has been elected Chairman of the Collingwood Board of Education for the current year. Congratulations, Dr. Mitchell!

Lieutenant McGuire Accidentally Killed

WORD was recently received from the War Office that Lieut. R. B. McGuire, undergraduate R.C.D.S., was accidentally killed about a month ago. Lieut. McGuire qualified as a bombing instructor after he went to England. It is probable, therefore, that his death was due to the explosion of a bomb either in action or while instructing some of his men in the use of these dangerous missiles.

Profound sympathy is felt for Mr. and Mrs. McGuire and family in their great sorrow, more particularly so as this is the second time they have suffered in this way as a result of the war. Their oldest son, Lieut. Harry Boulton McGuire, was fatally wounded by a gunshot in the abdomen on April 23, 1915, while gallantly leading his company against the enemy at St. Julien.

Lieut. Robert Blaney McGuire was a second-year student at the Royal College of Dental Surgery when he volunteered for overseas service in the autumn of 1915. He left Toronto for England the first week in January, 1916, with a draft of thirty-one University of Toronto students, who had been chosen to take commissions in the Imperial Army. Shortly after his arrival in England he was attached to the 15th Middlesex Regiment. After taking a six weeks' course for officers at Keble College, Oxford, he was sent to Fermoy, Ireland, for further training. He remained in Ireland about three months, and was there during the Sinn Fein uprising, being on special garrison duty at Fermoy for two weeks. About June 1st Lieut. McGuire rejoined his regiment, which was then in training at Shoreham-by-the-Sea. Last September he was sent to Godstone to take a course in bombing. Here he qualified as a bombing instructor. Upon the completion of this course he went to Watford, where his regiment had by that time taken up winter quarters. On March 20th Lieut. McGuire and seven other officers were sent to France as a draft to the 23rd Middlesex Regiment.

Lieut. McGuire was a young man of splendid physique, popular with his friends and fellow-students in Toronto.

Lieutenant R. M. Barbour Wounded

A DISPATCH from the front announces that Lieut. R. M. Barbour, who was a student at the Royal College of Dental Surgeons, class '17, has been wounded. Lieut. Roydon M. Barbour is a son of Captain (Doctor) Barbour, of Fredericton, N.B., who is now on duty in the C.A.D.C. at the base hospital, Toronto.

and is a brother of Sergeant Barbour, C.A.D.C., who is on his way overseas at the present time.

Lieut. Barbour attained the rank of captain, but reverted to that of lieutenant, in order to get more quickly to the front. It is to be sincerely hoped that Lieut. Barbour's injuries may not prove serious.

A piece of shell passed completely through Lieut. Barbour's lung, but recent reports indicate that he is making a most remarkable recovery and hopes soon to be on his feet again.

Canadian Army Dental Corps Overseas

Headquarters, C. A. D. C.,
Room 26, Pembroke House,
133 Oxford St., London W.
May 2nd, 1917.

DENTAL OPERATIONS PERFORMED BY OFFICERS OF THE CANADIAN ARMY DENTAL CORPS, IN ENGLAND, OVERSEAS AND B.M.E.F., FROM JANUARY 1ST TO MARCH 31ST, 1917, AND ALSO SHOWING THE GRAND TOTAL OF WORK COMPLETED SINCE JULY 15TH, 1915.

Total operations reported to December 31, 1916	Fillgs.	Treats.	Dents.	Prophy.	Ext.	Devit.	Total
January, 1917	228,499	49,851	36,023	24,389	210,279	26,985	576,026
February, 1917	20,167	5,909	4,040	2,016	15,516	2,041	49,689
March, 1917	22,509	7,459	5,506	2,234	16,121	1,830	55,659
	24,102	9,477	5,204	2,526	12,271	2,059	55,639
Total	295,277	72,696	50,773	31,165	254,187	32,915	737,013

NOTE.—Reports from a number of officers overseas have not been received. It is estimated these would increase the total some 35,000 operations.

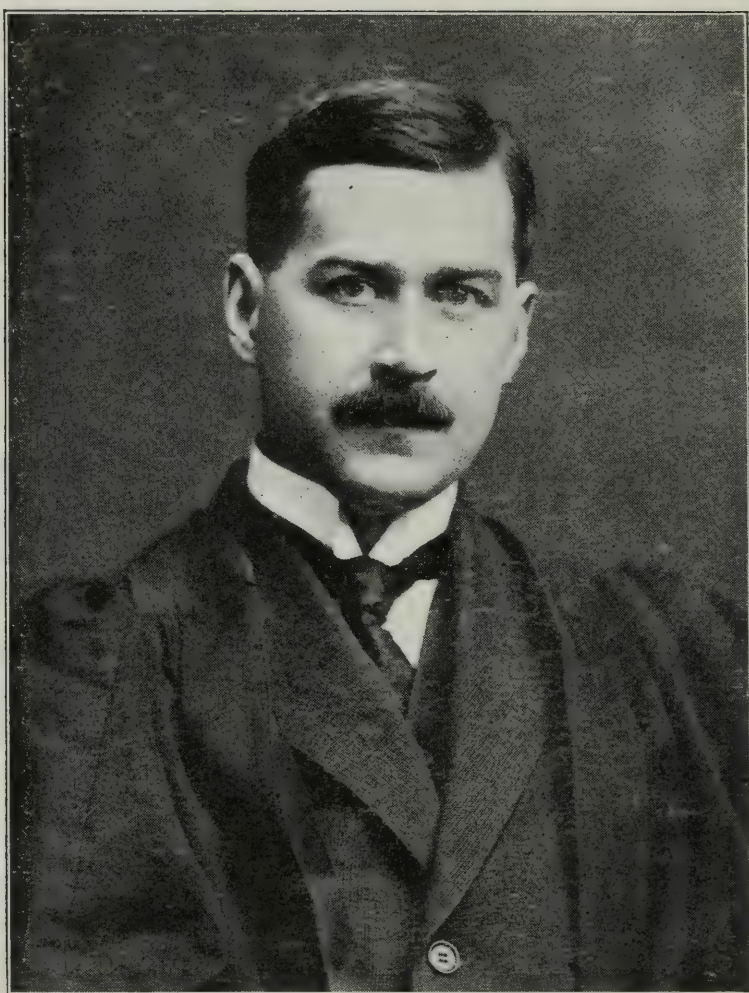
J. ALEX. ARMSTRONG, Lt.-Col.,
Director of Dental Services, O.M.F. of C.

Employees of Dental Company Enlist

THE following employees of the Dental Company of Canada, Limited, have enlisted for overseas service: Sergt. Louis Keats, Sergt. James Robertson, Capt. J. D. Webb, Sergt. K. M. Harris, Pte. Reginald Derrick, Pte. Laurence E. Thompson and Pte. Harry Kaufman. Mr. E. Cecil Maile, who went overseas with the first contingent, and who was seriously wounded at the Somme, has now recovered and has taken charge of the Students' and Equipment Departments.

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“ Watch Your Teeth ”

The New Health Slogan.



H. M. LANCASTER, B.A.Sc., Toronto

Provincial Chemist, Province of Ontario, and Acting
Director of Laboratories, Provincial Board of Health.

[Mr. Lancaster graduated from the University of Toronto in 1906 and was Fellow in the Department of Applied Chemistry during the session 1906-7. Mr. Lancaster has been continuously on the staff of the University since graduation and in 1914 became a member of the Faculty of the Royal College of Dental Surgeons of Ontario. As Professor of Chemistry of the R.C.D.S., Mr. Lancaster has always taken a keen interest in the application of the Science of Chemistry to the practical problems of Dentistry and particularly to these questions as they affect the preventive side of dental practice.]

ORAL HEALTH

A JOURNAL THAT STANDS FOR THE "OUNCE OF
PREVENTION," AS WELL AS THE "POUND OF CURE"

VOL. 7

TORONTO, JULY, 1917

No. 7

Trench Mouth

FROM THE MEMORANDUM C.A.D.C. RESEARCH LA-
BORATORY, LISTER INSTITUTE, LONDON,
S.W., DECEMBER 18TH, 1916.

MAJOR F. M. WELLS, RESEARCH OFFICER, C.A.D.C.

THE name of "Trench Mouth," which has been given to this ulcerative condition of the throat and mouth, has become the source of misunderstanding which has not been dissipated by the labours of a few writers who have been called upon to furnish the results of their knowledge upon this subject. This is one of the numerous examples of the magic influence of a word.

I have had occasion to study this affliction under all its forms, during the course of the last seven months, and have been able to determine that it is separated by special properties from some other inflammations, accompanied with membranous exudations—afflictions which are very distinct, and the characters of which I will point out in another report which will follow the present.

ETIOLOGY—I.

The appearance of this affection in the mouth varies very much according to its extent, or to its greater or less duration. It generally presents itself after a sore throat under the form of a greyish ulceration, occupying the undulating border of the gums; the tartar is deposited in greater quantity than in the healthy state on the surface of the teeth as the disease progresses. Their line of insertion is more particularly the seat of the disease, so that the adhesior of the gum to the neck of the tooth being gradually destroyed, a looseness of the teeth is the result. Frequently the affection extends to the mu-

cous membrane, lining of the lips, and more often, the cheeks; a white patch arises at the point of contact. It soon increases and becomes grey; sometimes it sinks deeply and the edges of this foul ulcer are swollen and a livid red color. Thick patches are detached from its surface and are replaced by new layers. The breath is rendered intolerably offensive as the disease progresses, and the disease then assumes the most specious resemblance to the true gangrene of the mouth, which is a more dangerous affection and one of an entirely different nature. I purposely omit peculiarities, the details of which at present would be out of place, and which can only be observed in following the progress and the successive stages of the disease. This variety of stonatitis is very infective. It is not selective as to sex, social conditions or occupation. Previous diseases have all to do with the production of this variety, especially if they are of that type which cause a viscose secretion from the salivary glands, causing a rapid fermentation and propagation of spirochaetes and fusiform bacilli.

BACTERIOLOGY.

In this variety of ulcerative stonatitis it is found microscopically that a variety of organisms are present. Vincent's (spirochaetes and fusiform bacilli) being the predominating ones in the smear from the mouth.

DIAGNOSIS.

The diagnosis is made on the character of the outset of the disease, and is usually found to be the progressive invasion of the disease after a sore throat. The mucous membrane in the back part of the mouth and distant part of gums back of third molar being first involved by mucous patches, the line of insertion of the lower anterior teeth being next involved. In the earlier stages of the disease the saliva is viscose and causes rapid fermentation in the mouth, as it is held in suspension on the mucous membrane and between the teeth. In early stages of the disease, the tongue has a morbid coating.

SYMPTOMATOLOGY.

At the outset of this variety of pyorrhoea the patient can usually recall having suffered with a sore throat and can very often give a positive date of first manifestations. Mouth and teeth are involved soon after, and if the patient is questioned it is learned that in the beginning of the disease these attacks were very mild, but they have gradually increased as the conditions became worse. The teeth at the beginning of exacerbation are not painful when brought into occlusion, but as the attack progresses they feel elongated and are loose and painful when brought together.

TREATMENT.

Within twenty-four hours, using one teaspoonful Fowler's solution every four hours, the painful symptoms gradually subside, the gums and teeth feeling quite comfortable after the second day.

If a patient presents himself with his mouth in a painful condition when teeth are brought into occlusion and feel elongated, the hygienic treatment in this variety is very important. If the disease is characterized by the presence of very little pus, the first step in the treatment is to get the patient to rinse out the mouth thoroughly with a warm, mild saline solution, repeating several times to remove as much mucous as possible from between the teeth and mucous membrane; then immediately follow with about a teaspoonful of *Liq. Arsenicalis*, instructing the patient to rinse it well over and hold it in the mouth for a minute or so, at same time cautioning him not to swallow any. This treatment should be carried on for two days, three times a day, and the following four days, twice daily. Several patients can be treated at the same time, as they do not require to be placed in chair for such treatment.

This variety of pyorrhoea is invariably accompanied by catarrh in the nose, and to get quick results in the mouth, instruct the patient to use a mild saline solution three or four times per day and clean the nose out thoroughly and keep perfectly clean. On the second or third day of treatment, if the teeth are no longer painful, thorough prophylaxis on the part of the patient and the dentist is necessary, but such scaling should not be done until mouth feels comfortable. Treatment should be continued for some time to prevent recurrence. For this purpose, an issue of a *Dentifrice*, containing 5 per cent. *Liq. Arsenicalis*, should be given to each man who presents himself for treatment. I have already supplied over 1,500 cakes to men and at the present time I am trying to get an order through for 100,000 for immediate distribution to Dental Clinics.

Treatment of Trench Mouth

CAPTAIN K. DAMAN, C.A.D.C.

1. PAINT all affected parts with Aconite and Iodine Solution.
(See Section No. 3).
 - (a) Preparatory.
 - (b) Remove all tartar.
 - (c) Syringe out the gum pockets around the teeth.
 - (d) Carefully wipe out gum pockets with pledget of cotton, moistened with some antiseptic such as Oil of Eucalyptus.
2. Mix Powdered Copper Sulphate with Eucalyptus Oil to form paste, adding a very small quantity of crystals of Menthol. Work this paste into pockets with a suitable instrument, carefully and thoroughly, all around the affected teeth.
3. Massage the gums with this mixture, both sides, and in the direction from roots to crowns of teeth:

Tinct. Iodine }
 Tinct. Aconite } a a ad Zii.

Crystals of Menthol—Half a grain.

4. Advise, Chlorate of Potash mouth wash three times a day.

5. Gum massage by patient with finger, moistened with Oil of Eucalyptus. Motion from apex of root to crown of teeth.

N. B.—In severe cases the solution in Section No. 3 should be used:

- (a) Wherever the mouth or throat is sore or ulcerated. 20% solution being used for tonsils. Treatment should be daily until the trouble is held in check.
- (b) In cases of diphtheritic throat, or tonsilitis, the throat should be swabbed out three times a day with a 20% solution of mixture as in Section No. 3.
- (c) In severe cases when mastication is extremely painful, the patient should be placed where he can secure a suitable diet, as the operation of mastication in such cases keeps up the irritation and delays healing. Carious teeth should be filled and ulcerated roots removed. The bowels should also be regulated, also systematic treatment.
- (d) For obtunding pain after extraction or relieving all inflammation of tissues, No. 3 solution will be found far in advance of the ordinary solution of aconite and iodine.

PLATINUM, PATRIOTISM AND LABORATORY PRACTICE.

PLATINUM is required in the production of sulphuric acid, which is itself a necessity in the production of high explosives.

Platinum is also extensively used in the timing apparatus for torpedoes and timed shells. During the past few years the price of platinum has advanced so rapidly that it is to-day approximately five times as valuable as gold. This advance has been due to the increased uses for this metal. It is used in lighting apparatus, it is used in laboratories, in the form of the well-known "platinum loop" for bacteriologic cultures, it is used extensively in dentistry, in photography and by some freak of fashion it is used in modern jewelry. From a purely esthetic point of view, its use in jewelry has but slight justification as it is not so beautiful as many other substances, and except for its intrinsic value, it seems to have but slight merit as an adornment. In the same way, its use in the laboratory, in dentistry and in photography may be overcome by the substitution of other less valuable metals. The great need of the metal in the processes mentioned which bear such a direct relationship to the war, and in which no other metal can be substituted for platinum, should cause the patriotic physician and the dentist to dispense with it wholly as an adornment and in the laboratory whenever possible.—*Journal of the A.M.A.*

Dental Surgical Work in Toronto Public Schools

CAPTAIN P. J. WATSON, C.A.D.C.

THE child is one of the greatest assets a country has, and therefore nothing that is of vital importance in its future welfare should be overlooked. Of late years a great deal is being done for the child, and not only is its education being looked after, but the health of the child is being guarded as never before.

Medical inspection in schools is being brought to a state of perfection that is indeed gratifying. When I say medical, I mean dental inspection also, for the oral cavity is one of the chief portals through which micro-organisms enter the body, and as a consequence, resulting in general systemic diseases. This is such a well recognized fact now, by the medical and dental professions, that the physician and dental surgeon work hand in hand to promote the welfare of oral hygiene.

The means whereby results are obtained in schools vary in different cities, and the advisability of a central clinic or clinics in various schools or outside places is still, with many, a debatable question. Both have their advantages and disadvantages, but from statistics showing dental improvement in the children of Toronto Public Schools, we can all quite approve of the methods adopted here.

The recent tendency in Toronto has been to form special clinics. The first one was a portable clinic for prophylaxis, and this was followed last September by a special central clinic, where all extractions could be done. This clinic was opened in the most central school of the city, and no time or energy was spared in making it complete in every way.

Outside of the fact that the equipment was complete in every respect, we always had at our disposal the services of a school nurse, and this, indeed, helped to ensure success and more efficient work—especially was this true in assistance in the administering of general anesthetics. It was also the nurse's duty to sterilize instruments, dismiss patients, and arrange appointments as required by the other school dentists, and at this time, either the nurse or dentist received all particulars regarding history of case.

In referring to equipment, it might be interesting to note that we duplicated our operating instruments, such as forceps, syringes, mouth props, tongue forceps, and gas apparatus. This duplication was very necessary when we had to treat from twelve to twenty patients per day, and thus no time was lost during the sterilization of instruments. Our means of sterilization will be quite familiar to all, and I will only refer to it long enough to say that Lysol was used for all rubber goods, Phenol for lances, and steam for the sterilization of gauze and forceps, etc.

In the choice of an anesthetic for a child or adult patient, I will not attempt to say which to use, local or general, for each case has to be considered on its merits. In an average mouth, when four or five extractions of permanent or temporary teeth was accomplished, about one-third of the cases were general and the remainder local, being extracted with either Novocain or Ethyl Chloride spray. For a general anesthetic we used Somnoform, and very much prefer this gas for children because of the fact that it is easy and pleasant to inhale. After-effects are of short duration, and the simplicity of appliances is also a great advantage. In order to further insure simplicity I used the Stratford Cookson Surgical Inhaler. This inhaler is the only effective one where a child has any nasal obstruction, and also, as very frequently happens, after you have exhausted your persuasive powers or patience with an obstinate case, it is a very easy matter to hold this inhaler in place and force the anesthetic for the first two or three inhalations. By this means many of these cases can be handled quite nicely.

I always used Somnoform for extremely nervous patients, and also in those cases where the teeth were abscessed. Another interesting feature in the use of this gas was that we quite frequently found that complete anesthesia was followed by a period of analgesia, in which a few roots could be extracted without causing the child any pain.

The age of children treated ranged from the baby in the kindergarten to the boy or girl of fourteen or fifteen in the senior grades, and, in order to be partially or wholly successful in working for children, a great deal of patience and consideration must be shown. By a few personal questions it is easy to find out what they are interested in, and then by continually talking to them their mind is distracted and the worst part of the operation can be accomplished before the child is aware of it.

Especially is this true of extraction. The child presents itself to you suffering pain, and as a rule the dread of the operation to follow has been fully dwelt upon by the parents, and for this reason I invariably insist on the parents staying at home and better results are thus accomplished.

The day is doubtless not far distant when it will not be necessary for a child to lose either its temporary or permanent teeth prematurely. However, at the present time, extraction in the schools is of vital importance. Through it the child is rid of excessive pain, disease, mental stagnation, moral deviations and irregular attendance, thereby increasing their working efficiency and laying the foundation of a healthier and more intellectual future generation.

As a closing remark on this subject, I would like to say that success in school dentistry or in a special clinic like this is obtained by hearty co-operation of dental inspector and school principal and their staff.

Persistent co-operation in any school will ultimately lead to the possible elimination from school life of disease and conditions and habits that induce disease.

The Work of the Canadian Army Dental Corps, Shoreham Area, England

CAPT. H. C. HODGSON, SENIOR DENTAL OFFICER, SHOREHAM.

“**O**RAL HEALTH” is read by the Officers of the Canadian Army Dental Corps in England and France every month with a great deal of pleasure; in fact, everyone is always eager to obtain his copy when a Canadian mail has arrived. The article by Major Geo. K. Thompson, A.D.D.S., M.D., No. 6, on the organization of his district was read with much interest by the writer. Perhaps not enough is known in Canada about the many difficulties which were met with in the organization of the corps in England, and when it is written it will make very interesting reading.

Perhaps a few words as to our method of handling the Dental Work in a Brigade may be of interest. The staff at this clinic consists of a Senior Dental Officer, eight captains, eight sergeants, and eight orderlies. The officers being: Capt. H. C. Hodgson, Senior Dental Officer; Capt. B. S. Bailey, Capt. J. A. Stewart, Capt. R. J. Yeo, Capt. F. Hinds, Capt. T. D. Campbell, Capt. D. W. Massey, and Capt. H. V. Schwalm. When a Battalion arrives from Canada it first goes into quarantine, and if no contagious disease develops within ten days they are released. Dental Nominal Rolls are made out and then the Battalion is inspected by the Senior Dental Officer, and every man requiring dental work is marked accordingly. These rolls are made in duplicate, the original being kept by the Senior Dental Officer and the copy sent to the Battalion Orderly Room. Arrangements are then made for parades of those who have been adjudged dentally unfit. Musketry only, takes precedence over dental parade. The Dental Nominal Roll must be sent by the Battalion in charge of an Officer or N.C.O. with each parade. As each man is completed he is marked so on both rolls. If he refuses treatment this too is noted on both rolls, and also in his Pay Book which he carries in his pocket. In this way the claim that the dentist neglected to fix the teeth cannot be resorted to should any dental trouble manifest itself. In this way there can be no discrepancies, as there is a check on every man. On every Monday a report of each Battalion in the area is forwarded to Headquarters by the Senior Dental Officer, showing the number of men Dentally Fit, the number Dentally Unfit, and the Number Under Treatment in the Brigade. A return is also forwarded to the Director of Len-

tal Services in London showing the number of men treated, the number completed, the number of operations, and the number of dentures made during the week.

The statistics in Major Thompson's article show that his Staff have accomplished considerable work, yet for comparison let me give the work done by this clinic in the months of January, February, March and April with the staff above quoted. The number of patients treated 6,866, number of patients completed 5,393, number of dentures made 873, number of plates repaired 221, number of operations 22,754. The large percentage of men completed will show that our chief aim is to supply men for the firing line by making them dentally fit. All clinics in England are showing the amount of work accomplished in about the same proportion.

The equipment at this clinic is all that is required for active service. Each officer is supplied with a "Primus" stove (gasoline), and an enamel sterilizer. All instruments are wiped with and laid upon steril napkins after use on each patient. Up to the present not one case of infection has been traced to a Dental Clinic in England, which speaks well for the efficiency of the corps.

Nowhere is the dentist called upon to such an extent to demonstrate his knowledge of Oral Surgery as in a clinic of the Canadian Army Dental Corps, as each day some unusual lesion of the oral cavity is presented to him for examination. Usually these cases call for prompt attention and considerable skill on the part of the operator, and as many such cases are infectious and very communicable, great care has to be taken in their treatment to protect the health of the troops, the good name of the corps, and the operator's reputation. Syphillitic conditions in the mouth are not unusual, while the ravages of mercury often demand the utmost patience and skill on the part of the dental officer.

Probably the most common of the infectious diseases of the mouth met with is Ulcerative Stomatitis, or "Trench Mouth," as it is commonly called here. The hardships which the boys are called upon to endure at the front, the not unnatural neglect of prophylaxis, and the reduced power of resistance, have gone far towards making this disease a menace to the general health of the troops, but the manner in which the dental officers here have successfully coped with it is worthy of commendation. During the first four months of this year we have treated in this clinic no fewer than eighty-seven cases of "Trench Mouth" and fourteen of Mercurial Stomatitis, and have reduced the number of cases to such an extent that at present it is a negligible quantity. With regard to the treatment of this offensive pathological condition arsenic with its different combinations is usually employed, though a variety of drugs has been used in an endeavour to get the most prompt and effective results. These, we

find, can best be attained by the use of arsenic, ipecacuhana, and glycerine in the proportions of three, four, and one.

When any case arises requiring a special appliance or material, Colonel Armstrong, the Director of Dental Services, who has the interests not only of the corps, but also of the men at heart, is very prompt in providing it without cost to the man.

As regards the discipline of the Canadian Army Dental Corps in this area, we have yet to have our first crime sheet, and whenever any special demand is made upon the officers or men to extend the day's work beyond the usual hours, in order to prepare a draft for the front, they are always to be found ready and willing.

New Dental Legislation in British Columbia

RICHARD G. McLAUGHLIN, D.D.S., PROFESSOR OF ETHICS AND JURISPRUDENCE, ROYAL COLLEGE OF DENTAL SURGEONS, TORONTO.

AN amended Dentistry Act of some considerable importance has recently come into force in the Province of British Columbia.

In many respects the new Act may be pronounced a decided step in advance and an improvement to the one it has superseded. The controlling body, known as the Council, has been given larger powers in regulating and controlling the profession. Also other features of the Act are worthy of commendation and will prove invaluable to the progress of the profession in that Western Province.

One forward step is worthy of more than passing notice: namely, the Council has been authorized to accept the Dominion Dental Council certificates, and holders of such will be duly registered as practitioners within the Province. This step on the part of British Columbia leaves but one province yet to be brought in to enable the Dominion Dental Council to be really Dominion wide in its scope.

However, this British Columbia Act includes, at least, one section which may lead the profession into difficulties in the years to come. Section 66, subsection C, reads as follows: "Notwithstanding anything herein contained, a graduate of dentistry of any university, college, or school of dentistry recognized from time to time by the Council, or other person entitled to take the examination as provided for in section 22, shall, on personally presenting his diploma or other qualifications and testimony of good character and conduct to the Council, and who has also produced evidence of preliminary education equivalent to that required by subsection (d) of section 22 of this Act, receive a permit to practise as an operator in dental surgery and as a practitioner in dentistry in the office of and under the supervision of a member of the College therein named, and such

permit shall not be transferable except by consent of the said member of the College, but such assistant shall not be required to pay any fees to the College. Such permit shall be in Form E of the Third Schedule to this Act, and shall continue in force for the period of one year from the date of issue thereof, and at the discretion of the Council may from time to time be renewed for additional periods not exceeding one year. Such permits shall be subject to revocation if the holder violates any of the provisions of this Act or the rules and regulations of the College; provided that no member of the College may have more than four assistants practising under permit under his supervision at any one time unless the Council so authorizes. (New)."

This is undoubtedly the weak spot in the whole Act. Graduates from certified outside colleges are allowed to practise dentistry in any office within the Province. There are two serious objections to this clause:

First: It is not playing fair with those who have complied with all the regulations under the Dental Act, and have thus expended time and money in order to register as legal members of the college. These graduates are compelled to share the practice of their locality with those who are practically undergraduates in the province. If there is a real dearth in the supply of regular practitioners this hardship may and doubtless will not be felt, but once the supply is equal to or above the demand, then the legal graduate should not be asked to share up with those who have not qualified.

The second and probably the more important objection to the clause is that it is really letting down the bars to the unlicensed practitioner. And British Columbia will realize, as others have, that it is much easier to let the bars down than to put them up again. Many of these "permit" men, when once they get a foot-hold in the province, will be constantly appealing from the Council to the Legislature for extended permits or even permanent licenses, because of long experience, good standing, etc., etc., etc.

This clause, we understand, was inserted in the Act in spite of the opposition of the better element of the profession. *It does appear to the writer that there is need of some Dominion organization of influence which would keep in touch with all such provincial dental legislations and thus promote greater uniformity and efficiency within the Dominion. The Dominion Dental Council gives us just such an organization. It is made up of, at least, one influential representative from each Province and is thus in close touch with all parts of the Dominion. Already it is doing much good work, but we respectfully suggest it might well extend its sphere of influence beyond that of conducting examinations and granting diplomas. The advice and assistance of such a Dominion body would have materially help-*

ed the British Columbia men in their struggle against the insertion of such a clause.

The section forbidding fraudulent and unprofessional advertising is a most creditable one and, if enforced, will prove the death knell to the advertising element in British Columbia.

Altogether the dental profession in the Pacific Province is to be congratulated on the trend of the Act as a whole. It bespeaks a good healthy tone in the Province and a genuine desire to protect the public and uphold the dignity of the profession.

A Government Taxing Officer for Dental Fees

FRED. J. CONBOY, D.D.S., TORONTO.

THE Ontario Government, by order-in-council, appointed Mr. Justice Hodgins a commissioner, to investigate and report upon the status of the Medical and Allied Professions. By this Order the Commissioner was given very wide scope and authority, and consequently felt it his duty to consider the relationship existing between the Dental Profession and the public, in regard to fees. He communicated with the Royal College of Dental Surgeons of Ontario, requesting the Dentists to state their views regarding the appointment of a Taxing Officer who would decide, in this connection, all matters in dispute between the Dentist and his patient and the fixing of a tariff to guide such an officer in arriving at a decision. A Committee was appointed by the Board of Directors to appear before Mr. Justice Hodgins and present the case for the Dental Profession of Ontario.

This Committee contended that there was no urgent need for the appointment of a Taxing Officer; that the public were not clamoring for such an establishment, but on the contrary were satisfied that they were receiving commensurate and ample returns, for the money expended for Dental services. It was submitted, however, that if the Commissioner decided to recommend the creation of such an office, the selected Taxing Officer should be a member of the Dental Profession and a man of ability and standing. No man, who had not a knowledge of Dentistry gained by study and practice, could possibly decide upon the value of a given dental service, nor could he properly estimate the success or failure of a certain operation, unless he was entirely familiar with present-day ideas and methods. Dentistry is making such rapid progress and advancement, that one who does not regularly attend Dental Conventions and continually read Dental Literature, is soon hopelessly behind the times, and such a one, in such a position, could not properly decide the merits or demerits of a case in a dispute between a Dentist and

his patient. To decide the value of a modern operation in the light of antiquated methods would be a great injustice to the Dentist. Then, too, the Taxing Officer must be chosen from men of standing and ability, otherwise the members of the profession could have little confidence in his fairness or judgment. In short he must be a man who has enjoyed a good practice, done acceptable work and received commensurate remuneration. The Committee tried to impress upon the Commissioner the fact that if such a man is to be secured, the Government must be willing to pay a sufficiently large salary to attract the "good man" of the profession, otherwise no such office should be created.

The Committee strongly opposed the establishment of a tariff, either on the basis of so much per operation or on the basis of time. In the first instance, no allowance could be made for the skill of the operator, or the success of his work beyond that necessary to pass the Taxing Officer as a finished and remunerable product. It is generally recognized that one Dentist may do a certain work, which is worth more to his patient, than a similar operation performed by another man is to his patient. Then in order to get a reasonable fee the Dentist would feel it necessary to make as many individual and separate operations as possible; for example—if there were several small cavities on the occlusal surface of a molar, he would be tempted to treat them all as separate cavities, rather than extend them into a single cavity as should be done. Such a practice would be detrimental to the best interests of the patient and lower the self respect of the operator.

Then again, no allowance would be made for the fact that it is a great deal more difficult to work for some patients than for others, and that those upon which the Dentist must expend more energy should pay a larger fee. To have a fixed tariff upon the basis of time alone would be to put a premium upon indolence and tardiness. The longer a man spent in doing a certain work, the larger fee he would receive. The skillful operator can very often accomplish a certain work as successfully and in less time than the less skilled, and under a flat tariff would receive a smaller fee for a better operation.

Mr. Justice Hodgins asked the committee to consider the desirability and feasibility of having a minimum tariff and placing upon the Dentist the responsibility of proving to the Taxing Officer that his work was worth a larger amount. Upon this question the Committee will make further representations. The Commissioner also pointed out the advantage which would accrue to the profession in the collection of accounts. If a patient refused to pay a reasonable fee the Dentist could take the account to the officer to have it taxed; he could then take the written decision of the Taxing Officer to the proper authority and secure a judgment, thus obviating the neces-

sity of discussing the operations and their success or failure in open court. When Mr. Justice Hodgins has completed his report it will be presented to the Ontario Cabinet, and the members of the profession will have an opportunity to present their views to that body, providing the report does not meet with their approval. In the meantime, the Committee would welcome any representations or suggestions which any member of the profession would like to make in regard to the matter.

Proceedings Dental Societies

Manitoba Dental Association PRESIDENT'S ADDRESS.

M. H. GARVIN, D.D.S., WINNIPEG.

IT is indeed a privilege and an honor to stand before you to-night in the capacity in which I find myself and present the President's report.

In the thirteen years that I have been identified with the dental profession of the Province of Manitoba, the thought which has impressed me most is that here the handclasp is a little firmer, here the smile a little broader and here one can make friends without half trying. In such an atmosphere, surrounded by such a spirit, one should surely do his best, and yet we have fallen short in many ways. We have fallen short because we have been too busy. I do not mean too prosperous, but simply too busy. Often do we resemble the fellow with the muckrake in "The Pilgrim's Progress," we look down so long that we simply can't look up and see the real beauties and opportunities that surround us on every hand. We keep our noses on the grindstone until we cannot see the real opportunities in our very work itself.

Could we not take a few days off before Spring, and watch ourselves go by? Form a study class, if you will, of the whole profession, and bring in some outside talent, not to entertain us, but to instruct us. Let us raise the standard of our work, then raise our fees, to the level where they belong, when we shall have more time and opportunity to play the role of a higher type of citizen. However, let us not forget that to raise standards of work and fees means even greater chaos in the lives of those unable to pay for that service unless we can do something to educate our people as to the importance of prevention, that the only solution of the difficulties as to time, expense and health involved in the treatment of a tooth, for instance, is not to allow it to decay.

Then again, could we not do more to teach our people the terrible results of mouth infection due to neglect, and I fear too often to quackery in our midst, be it so called ethical or unethical, or is ignorance responsible sometimes? Could we not do something to give the childhood of our Province a decent start in life? At present practically nothing is being done in Winnipeg, from a dental standpoint, which places the city in a very undesirable position among even the larger towns of our land. At present very little is being done to care for the poor of our community.

The power of the Board may be somewhat limited in handling these great problems, but it is quite within its rights to stimulate in every possible way individual members or groups of individuals in the profession, to think and act along even higher planes.

During the past year the work of the Board has been chiefly in connection with the forming of and taking before the Legislature, of our new Dental Act, and then in making what provisions were possible to enforce the Act.

While there are some features that are not very palatable, but even nauseating, I refer to those sections which permits a man to advertise methods which, while they may not be legally wrong, are morally misleading, that lower the standards of our noble profession, that besmirch the minds and characters of those stooping to such methods, that scar the very soul of those that are for a time hoodwinked, yet after all this is said, we have an Act of which in many respects we should be justly proud, and an Act that we believe to be workable. The Secretary will deal more fully as to certain clauses in that Act in his report.

During the past year the grim reaper has visited the homes of some of our members. We mourn with those who mourn.

And in other homes joy and happiness have come in addition to the home life, a wife, or a child. We rejoice with those that rejoice.

And, in closing, it is gratifying to me to pay the highest tribute to my associates on the Board, for most loyal and helpful co-operation during the past year. We have made some progress, but this must only be looked upon as a stepping stone to something higher.

Emerson has said, "The truest test of civilization is not the census nor the size of its cities, not the crops—no but the kind of man the country turns out." So with us, what really counts is the kind of men we are producing in our profession, and the Board's greatest duty is, I believe, to "Hew the block off and get out the Man," and do it quickly.

"We live in deeds, not years; in thoughts, not breaths;

In feelings, not in figures on a dial,

We should count time by heart throbs. He most lives

Who thinks most, feels the noblest, acts the best."

SECRETARY'S REPORT.

MANLY BOWLES, D.D.S., WINNIPEG.

I N again presenting for your consideration the Secretary's Report, permit me to thank you for the privilege of so doing. The regular meetings of the Board have been held during the past year, also nine special meetings. In addition, the members of the Board spent considerable time at the Legislature, while your Secretary has also had occasion to visit the police court.

Changes have taken place in the personnel of the Board since our last meeting. The resignations of Drs. Morrison and Bray were accepted, as these men had gone overseas with the Canadian Army Dental Corps. Their places were filled by the appointment of Drs. C. P. Banning of Winnipeg, and C. A. Powers of Brandon. Your Secretary also has the resignation of Dr. A. W. Myles, who has likewise gone overseas. This resignation has been left by the retiring Board for the incoming Board to deal with.

Our Association is still growing. During the past year twelve licenses to practice dentistry in the Province of Manitoba were issued by your Board. Four of these were granted as a result of the examination held last January, four on presentation of certificates from Dominion Dental Council, and four on presentation of certificate from the University of Manitoba. We welcome these members, and hope they will take an active part in the affairs of the Association.

Ten men are the holders of Temporary Permits. Of these permits seven were issued by reason of the applicant being a resident of Manitoba at the time this amendment was made to the Dental Act.

We have to record the death of five members of the Association, namely: Drs. Ferguson, Keough, J. F. Taylor, Sr., McLaurin and Duff, the last two dying the death of heroes on the battle fields of France.

During 1916 over two hundred written communications were received by your Secretary, while he has sent out over eight hundred letters, circulars, etc. Personal interviews have also been many.

Following the resolution, passed by this Association at its meeting one year ago, the committee appointed to consider the question of amendments to the Dental Act, met on January 21st. The Association's solicitor, Mr. Loftus, was also present, and the amendments to the Act as prepared by the Board, were fully considered. Some changes were made to the proposed amendments, and the Board instructed to have same presented to the Legislature. This was done, the amendments being introduced by the member from Virden, Lieut. Colonel Clingan, and though we did not succeed in having all the amendments pass as we wished, yet considerable change was made in the Dental Act. We cannot here discuss, or even mention, all the

changes, but will limit ourselves to two points of difference between the amended and the former Act.

First. The examination for license to practice dentistry in this Province is now conducted by, and is under the control of, the University of Manitoba. This is new work for the University, and some time will necessarily elapse before the best results of the change are apparent. Your Secretary believes that the change is for the better, and realizes that it was largely owing to the efforts of past Boards that the University at last agreed to undertake this work.

The other change I would mention is this: (Clause 33 A) "It shall be unlawful for any duly licensed and registered dentist to employ any person as an operator in dental surgery or practitioner in dentistry, or to cause or knowingly permit any person to act as an operator in dental surgery, or as a practitioner in dentistry, who is not duly licensed and registered as a practitioner in dentistry as provided by this Act." Two members of our Association have already been charged with the violation of this clause.

There are other changes in the Act, but as a copy was sent to each member, I will not discuss them, save to say that the Board did not obtain all the amendments we asked for, and we did oppose some of the amendments which were finally passed.

The passing of the amendments necessitated new by-laws. These have been passed, and a copy sent to each member of the Association. These by-laws are subject to repeal by the Lieut.-Governor in Council, and upon publication in the Manitoba Gazette, became law and hence have not to be ratified at this time. However it is open for this meeting to discuss these by-laws, and if any change is desired, either by way of repeal, amendment or additional by-laws, no doubt the incoming Board will carry out the wishes of the Association.

During the past year six informations have been laid by your Secretary, against six different persons, for violation of the Dental Act. As previously intimated, two of these were against licensed dentists, both of whom pleaded guilty. Three of the others also pleaded guilty, and on the advice of our solicitor the other case was withdrawn. The fines, amounting to two hundred and fifty dollars, have been paid to our solicitor, and in due time will be received by the Association. The fines do not pay the cost of prosecution.

In uniformity with the motion passed at the last meeting of this Association, your Board authorized the Treasurer to pay all annual dues of enlisted members of this Association. This is being done, so that all these men will be in good standing on their return.

We are glad to note that the Militia Department has recognized the services of the C.A.D.C., and has given to all dentists, with two years' experience, the rank of Captain, while the Commanding Officer holds the rank of Major.

In closing this report, I feel that I would be remiss in my duty if I failed to mention those members who have enlisted. First we will call to mind, in grateful memory, the names of our two fallen heroes, the late Dr. McLaurin of Winnipeg, and the late Dr. Duff of Portage la Prairie. These two have made the great sacrifice for King and Country. May their sacrifice ever be an inspiration to every member of our Association.

The following are the names of the other members of our Association who have enlisted, and who are now enrolled in the Canadian Army Dental Corps:

J. A. Adams, Winnipeg.	F. J. Moffatt, Winnipeg.
B. S. Bailey, Dauphin.	C. H. Moore, Winnipeg.
N. S. Bailey, Portage la Prairie.	J. E. Kelly, Brandon.
J. F. Blair, Hartney.	J. F. Morrison, Virden.
G. H. Bray, Morden.	W. R. Morrison, Virden.
B. E. Brownlee, Winnipeg.	A. W. Myles, Treherne.
R. W. Fell, Winnipeg.	M. A. McLaren, Killarney.
A. A. Garfatt, Winnipeg.	W. H. Reid, Winnipeg.
W. H. Gilroy, Winnipeg.	J. M. Rogers, Treherne.
A. R. Graham, Boissevain.	D. S. Rose, Brandon.
W. F. Hackett, Winnipeg.	H. V. Schwalm, Winnipeg.
H. E. Hodgson, Russell.	D. P. Stratton, Melita.
A. R. Hurst, Winnipeg.	W. W. Wright, Winnipeg.
H. C. Jeffrey, Carberry.	R. J. Yeo, Winnipeg.

In addition to the above:

Dr. K. C. Campbell, is connected with the 43rd Battalion

Dr. H. A. Croll, with the 10th, C. M. R.

Dr. J. P. Coghlan, with the C. A. S. C.

Dr. W. H. McNally, with the 79th Cameron Highlanders.

In conclusion, I would again thank you for the honor conferred upon me, and would bespeak for my successor in office the same kindly consideration you have shown me.

REGISTRAR'S REPORT.

C. P. BANNING, D.D.S., WINNIPEG.

ON taking over the books about the beginning of last year, your present Registrar found that the fees in arrears amounted to about \$315.00, exclusive of those owing by the members who have enlisted.

In a number of cases these fees were owing for six, eight, ten years or more, consequently in some cases it was hard to make collections, and some members felt that they should not be called upon to pay these amounts.

There is still outstanding \$90.00 of this amount not collected, but

if the Association wishes, it can all be collected, with the exception of \$28.00, which is owing by one member who has left the Province, and one who has given up practice. This leaves a balance of \$62.00 collectable, and this amount is owing by ten members.

The number of members who have enlisted, according to the books, is twenty-seven, but the list is not complete, and there will be, shortly, a number more joining the C.A.D.C.

The total amount of money collected this year by the Registrar, is \$470.00, which is double that of any preceding year. From this should be deducted fees paid by the Association for enlisted men, namely \$58.00, leaving the net amount of \$412.00 collected in cash this year. All of which is respectfully submitted.

**STATEMENT OF RECEIPTS AND DISBURSEMENTS FOR
YEAR ENDED 31ST DECEMBER, 1916.**

Receipts.

Bank Balance 1st January, 1916		\$2,469.31
Temporary Permits	\$1,000.00	
Examination and License Fees	800.00	
Registration Fees (Professional)	470.00	
Registration Fees (Students)	100.00	
Matriculation Fees	10.00	
Fines	150.00	
Bank Interest	39.94	
M.D. No. 10 Compensation for chairs destroyed	25.00	
		<u>2,594.94</u>
		<u>\$5,064.25</u>

Disbursements.

Sundry Legal and other Expenses in connection with new Act and By-laws	\$1,111.00	
Fees paid to Secretary	300.00	
Fees paid for Board Meetings	293.00	
Fees paid to Examiners	167.30	
Fees returned	66.66	
Fees paid for members in Army Dental Corps	58.00	
Sundry Expenses:		
Legal Expenses	\$132.90	
Printing and Stationery	124.25	
Audit Fees	70.00	
Pinkerton's Agency	34.30	
Sundries	24.80	
Postage, Telegrams and Insurance	14.87	
	<u>\$401.12</u>	
Bank Balance 31st December, 1916		<u>\$2,397.08</u>
		<u>2,667.17</u>
		<u>\$5,064.25</u>

Audited and found correct.

WEBB, READ, HEGAN, CALLINGHAM & CO.,
Chartered Accountants.

Invitation—Toronto Dental Society

THE Committee of the Toronto Dental Society wish to invite Dentists, not practising in Toronto, to become members of the Society for the coming season. Full particulars may be obtained by communicating with the Secretary,

DR. A. S. THOMSON,
1400 Queen W., Toronto, Ont.

British Columbia News

MAJOR H. T. MINOGUE, C.A.D.C., VICTORIA.

THE last monthly meeting of the 1916-17 season of the Vancouver Dental Society was held at the Commercial Club on Friday, 27th April. Following dinner, the guest of the evening, Dr. M. T. MacEachren, Superintendent of the Vancouver General Hospital, read a very instructive paper on "The Relation of Oral Infections to Systemic Disease." (or something like that), Supplementing same by quoting several illustrative cases from clinical records. A keen and interesting discussion followed, in which several members of the Medical profession, who were present, took part, it being generally agreed that in the matter of dealing with and eliminating focal infections, the dental profession would in future play a very prominent part. In fact, Dr. MacEachren gave it as his opinion that all hospital staffs should include a dentist on the personnel.

Prior to the conclusion of the meeting, the election of officers for the coming year took place, and resulted as follows:

President—Dr. P. D. MacSween.

Vice-President—Dr. R. L. Pallen.

Sec.-Treas.—Dr. R. L. Coldwell.

Executive—Drs. H. Wood, W. R. Spencer, E. C. Jones, F. Pollock and T. W. Snipes.

The Vancouver School Board has appointed Dr. R. L. Pallen as assistant to Dr. J. Milton Jones at the School clinic. Hours to be 9 to 12 daily, and salary \$100.00 per month. A lady assistant was also appointed for the clinic.

Dr. Jones was also authorized to purchase the necessary extra equipment, cost of same not to exceed \$550.00.

C. A. D. C. ITEMS.

Officers from M. D. 11 on 6th Draft—Captains R. C. Bamford, A. A. McRae, Lieuts. A. H. L. Campbell, C. N. Westwood. Left Victoria April 20th.

The following have been recently appointed to the C.A.D.C.: Captains F. H. Moore and R. Ford Verrinder, Lieut. F. J. Bezeau.

Capt. Verrinder was for many years Registrar of the B. C. Dental Council.

Sergt. H. E. Jones, prior to leaving with the 6th draft, received his certificate of qualification as an Instructor in Physical Training. For some time he had had charge of the C.A.D.C. "Physical Jerks" class in Victoria. To prove his versatility, he can also produce a certificate as Musketry Instructor.

Much sympathy was felt for Capt. M. C. Bagnall, in charge of the Vancouver clinic who, quite recently, in warding off a savage attack from his "Ford," emerged from the fray with a fractured forearm. As a result of this injury, he was prevented from proceeding overseas with the last draft.

The Dental profession in B. C. received a great shock on Saturday upon learning of the death of Dr. J. E. McGregor, of Nanaimo, following an operation for appendicitis. Ernie appeared to be in the best of health, and his genial smile and husky frame will be greatly missed at dental gatherings in future.

Dr. A. Brighthouse has been re-elected as a member of the B. C. Dental Council.

Dr. Ida O. Montgomery has resumed practice in Vancouver.

Annual Report of the Ontario Oral Hygiene Committee of the Ontario Dental Society, May 1917

To the Members of the Ontario Dental Society:

THE Ontario Dental Society held its annual convention in Toronto in May, 1916.

The members of the Executive of the Ontario Oral Hygiene Committees are composed of, first, those elected at the annual meeting of the Ontario Dental Society; second, those who are ex-officio members; and third, the dental officers in charge of the public dental clinics, or School dental clinics, in the Province of Ontario. The ex-officio members consist of the past chairmen of the Executive of the Oral Hygiene Committee, and the chairmen of the several sub-committees throughout Ontario.

The following are the names of the Committee elected by the Ontario Dental Society for the year 1916-17:—Doctors R. G. McLaughlin, H. E. Eaton, R. J. Reade, N. S. Coyne and A. W. Ellis.

The Executive of the Ontario Oral Hygiene Committee held its 54th meeting on Thursday, June 8, 1916.

The members present were Doctors McLaughlin, Seccombe, Eaton, Coyne and Reade.

The results of the election of officers of the Executive were as follows:—Dr. R. J. Reade, Chairman; Dr. H. E. Eaton, Vice-Chairman; Dr. N. S. Coyne, Secretary; and Dr. A. W. Ellis, Treasurer.

The committee were of the opinion that the main feature of the work for the coming year should be to interest the rural districts to undertake the work of Oral Hygiene. With this end in view, the Secretary secured the names of the various school teachers' conventions to be held in different parts of Ontario, for the purpose of having papers on Oral Hygiene presented at their conventions.

The committee thought it would be a great aid to those undertaking the responsibility of addressing the teachers' conventions if they had an outline of the various methods in which the subject should be presented. Dr. Wallace Seccombe was requested to draw up such outlines for the purpose of having same printed by the committee, and sent to the different men undertaking this work, so that there might be a uniformity in the presentation of the subject.

During the past year the pamphlet which your committee had in hand for publication by the Agricultural Department of the Province of Ontario, was completed and printed by the Government. Any member of the dental profession can have copies of this pamphlet, for distribution to their patients, by writing to Mr. Geo. A. Putnam, Parliament Buildings, Toronto. There are also pamphlets previously prepared by your committee which may be had by application to Mr. Putnam. They are "The Teeth and Their Care," and "Decay of the Teeth."

During the year, the Executive Committee held six meetings.

Regarding addresses to the Teachers' Conventions there was correspondence sent to the following:—Doctors C. A. Snell, Essex; R. E. Sparks, Kingston; W. B. Cavanagh, Cornwall; F. E. Bennett, St. Thomas; and M. A. Morrison, Peterboro.

Your committee secured a lecturer to address the Teachers' Conventions at St. Thomas and Essex.

Dr. E. H. Wickware, Smith's Falls, wrote regarding the appointment of a dentist to speak on Oral Hygiene before the Trustees' and Inspectors' Section at the annual meeting of the Ontario Educational Association. Dr. Wallace Seccombe being the Chief Dental Officer of the Public School Dental Department, it was thought that he would be the most suitable lecturer for the occasion, and was therefore appointed.

Your committee, during the year, were asked by the Ontario Safety League to prepare both industrial and school bulletins regarding teeth and health. This was done.

Your committee has under consideration a plan whereby dental inspection might be made of the teeth of the children over certain prescribed areas in Ontario. For example, in two counties, in order to obtain statistics to present to the Government, if asked advice concerning compulsory dental inspection throughout the Province. Letters were sent to Dr. F. E. Bennett, St. Thomas, and Dr. Mark G. McEl-

hinney, Ottawa, asking them if they would be willing to be responsible for arrangements whereby the teeth of the children of the rural schools of their counties could have their teeth examined. Both Dr. Bennett and Dr. McElhinney were good enough to signify their intention to make arrangements for such examinations.

Charts for the purpose of lecturing have been loaned to various sub-committees throughout the year.

In order to be in a position to advise the Government, if required, a draft letter was sent to the members of the sub-committees of the Oral Hygiene Committee, asking them their ideas on the proposal to transfer the dental inspection from the control of the Department of Education to the Provincial Board of Health. The majority favor the Board of Health.

In accordance with instruction from the Ontario Dental Society, your committee held the annual conference of the Oral Hygiene Committee in Toronto on Tuesday, November 21st. The program arranged and carried out was as follows:—

The delegates assembled at the College Building, 240 College Street, at ten o'clock in the morning. As there were some new features introduced into the college work, the delegates were taken for a tour of inspection through the building.

After the inspection automobiles were in waiting to take the delegates to Orde Street School. This school has a roof garden and is used as a continuation, in winter, of the forest school which is held in summer. The children and teachers work altogether outside, having special wearing apparel to suit the conditions. The delegates arrived in time to see the children have their dinner, which is supplied by the school; and also to see the means they have of cleansing their mouths after their meals. After dinner, the children are put to bed to rest for an hour. At this school an outfit for a movable clinic was exhibited.

From the Orde Street School the delegation was taken to the Board of Trade for luncheon. After luncheon, Dr. C. K. Clarke, of the Toronto General Hospital, gave an address.

Following the address, the delegates were motored out to the Military Camp Grounds to see the work carried out by the dental clinic, and also to make a tour of inspection over the grounds.

Following this the party proceeded to the Walker House for dinner.

After dinner, Mr. J. A. Taylor, B.A., Public School Inspector of St. Thomas and West Elgin, spoke on "The Necessity of Dental Inspection in Rural Communities."

Dr. R. G. McLaughlin opened the discussion on Mr. Taylor's paper.

At the conference, a special effort was made to have the members of the Oral Hygiene Committee bring with them the inspectors of their districts, or their dental officers.

The following is a list of those present at the conference:—
 Dr. E. H. Eidt, Stratford; Dr. T. C. Trigger, St. Thomas; Dr. W. E. Struthers, Toronto; Dr. R. G. McLaughlin, Toronto; Dr. A. E. Webster, Toronto; Dr. R. J. Reade, Toronto; Dr. W. Cecil Trotter, Toronto; Inspector J. A. Taylor, B.A., St. Thomas; Dr. F. E. Bennett, St. Thomas; Dr. M. A. Ross Thomas, London; Dr. A. W. Ellis, Toronto; Dr. R. D. Thornton, Toronto; Dr. A. J. McDonagh, Toronto; Dr. N. S. Coyne, Toronto; Dr. Wallace Secombe, Toronto; Dr. H. E. Eaton, Toronto; Inspector J. M. Denyes, M.A., Milton; Dr. F. R. Watson, Georgetown; Dr. T. F. Perkin, Grand Valley; Dr. A. H. Mabey, Gananoque; Dr. O. Little, Westport; Dr. J. A. Bothwell, Stratford; Dr. C. A. Kennedy, Toronto; Dr. T. F. Campbell, Galt; Dr. R. M. Stewart, Markham; Dr. E. H. Wickware, Smith's Falls; Inspector J. H. Smith, M.A., Stratford; Dr. R. W. Hoffman, Toronto; Inspector A. Mowat, M.A., Peterboro; Dr. J. E. Middleton, Peterboro; Dr. M. A. Morrison, Peterboro; Dr. D. C. Smith, Stouffville; Dr. S. P. Reynolds, London; Dr. W. B. T. Amy, Toronto; Dr. J. F. Simpson, Trenton; Dr. A. J. Broughton, Toronto; Dr. A. E. Santo, London; Dr. W. E. Wray, Toronto; Dr. C. K. Clarke, Toronto; Dr. A. A. Ely, Kitchener; Dr. L. A. Koeppel, Kitchener; Dr. A. E. Little, Owen Sound; Dr. J. W. Barker, Cannington; Dr. C. E. Biehn, Chesley; Inspector E. B. Caldwell, M.A., Chesley; and Dr. H. W. Baker, Stratford.

The following is an outline of the proposed method of dental inspection in rural communities in the Province of Ontario, adopted by your committee:—

First: That this work be undertaken as a public health measure, organized upon the basis of the municipality (one or more townships) as the unit.

Second: Provincial dental officers be appointed to spend from two to three days in each municipality in the Province, visiting the schools and carrying on educational propaganda, as follows:

- (1) *Schools*—(a) Examination of scholars' teeth.
 (b) Parents' notification of dental defects.
 (c) Class room instruction.
 (d) Arrange for follow-up by teacher.

(2) *Public Meetings*—*Illustrated Lectures*, etc.

(3) *Distribution of Literature and Press Articles on Oral Hygiene*.

Third: That municipalities receive this special dental service once each year, for which they, or some other local body, pay the actual transportation and living expenses of the dental officer while so engaged.

Fourth: That a dental officer visit at least eighty municipalities during the school year.

The question of rural dental inspection is now being considered by members of the Provincial Government. Your committee appointed Dr. F. J. Conboy to represent the committee in the preliminary negotiations tending to secure such a desirable result as rural dental inspection.

The names of the sub-committees and the special reports of the sub-committees will be published with the main body of the report and sent to every dentist in Ontario.

Executive Report Oral Hygiene Committee O.D.S.

THE Executive Committee of the Oral Hygiene Committee of the Ontario Dental Society, held its 59th meeting on Monday, May 14th, at the Crescent Inn, 473 Spadina Ave., at 6 o'clock p.m.

Members present were: Drs. Reade, Eaton, McLaughlin, Ellis, Bothwell, Seccombe and Coyne.

Minutes of the last meeting were read and confirmed.

The Secretary read correspondence from Dr. M. G. McElhinney, Ottawa, and Dr. F. E. Bennett, of St. Thomas, in reply to letters written to them in regard to examination of school children's teeth in their respective counties. Both Dr. Bennett and Dr. McElhinney signified their willingness to be responsible for such examination.

Chairman read report of year's work, also report from the Chairmen of the sub Committees, regarding the year's work in their localities.

Dr. Seccombe submitted a draft-plan for Provincial Inspection of the children's teeth in rural schools.

The balance of the meeting was spent in discussion of this proposed plan.

It was moved by Dr. McLaughlin, and seconded by Dr. Eaton, that the Oral Hygiene Committee appoint Dr. Conboy as their representative in the preliminary negotiations with the Ontario Government with a view to making Rural Dental Inspection compulsory throughout the Province. Carried.

The Secretary was instructed to notify Dr. Conboy of his appointment.

Meeting adjourned at 8.30 p.m.

N. S. COYNE,
Secretary Oral Hygiene Committee.

Letters from the Front

Whitley Camp, Surrey, England,
13th May, 1917.

Dear Doctor Seccombe:

My long-looked for chance of getting to France has come at last, or at least so it appears. At present I am attached to the 15th Canadian Field Ambulance of the 5th Canadian Division, waiting to go across if *nothing* happens. We always have to put in that proviso in this "business."

I have received copies of "ORAL HEALTH" and seen others and have, from time to time, come across communications from officers over here—so will not burden you with an attempt at describing how things are run here in the C.A.D.C. Have been at Bramshott, Whitley, Shorncliffe, Monks Horton, Hastings and Shoreham Camps, and now I am back in Whitley again waiting to go overseas.

At the present time we are having beautiful weather, and quite hot, although we never get it hot here like we do in Canada and the nights are nearly always cool.

This is a spot of Rural England and it is certainly nice. The soil, however, is sandy and not very well suited for farming. Right around the camp is bush and waste land. In fact this looks like the original home of the pine species. None are very large, and I cannot say whether this is due to the land or that the old ones were cut down years ago.

The chief source of worry at the present time seems to be the submarines. So far there has been no real shortage of food supply. In our officers' messes we have potatoless and meatless days, and I have noticed that gradually many of the so-called luxuries have disappeared and others become very expensive. In fact all foods are dear, although in many cases prices are controlled by the Government.

When I first came over here, a year ago December, one would not realize there was a war on at all. It is somewhat different now, although people seem to become accustomed to it, and looking back over the time when everyone looked upon such a catastrophe with unspeakable horror, it is surprising to see with what determination it is carried through. True there are "slackers" over here who go under the name of "Conscientious Objectors," and a good many do not like the way they are being handled. But there are very, very many things to admire in the way the vast majority of the people have got into this terrible struggle.

I have heard some very interesting stories first-hand and was fortunate enough to come across one man who was a prisoner in Germany for twenty-one months. He was "gassed" and taken prisoner

in April, 1915, at the first time the Germans used gas. He said at that time the Germans simply bayoneted all the wounded who could not walk. When he was first taken prisoner he was treated badly. Afterwards was used a little better, then when that German peace offer was refused, he was used very badly again. He had a tooth knocked out while in prison camp, by the butt end of a rifle belonging to one of the guards. When he broke away he was sixty miles from the Dutch frontier. There was four of them. It took them four days and three nights to make the trip. All they had to eat was a few biscuits, and in the day time when they couldn't get any other cover they used to bury themselves in the peat on the moors. There were fourteen of them out working on the estate of a Baroness, felling trees, etc. Ten of them knew that these four wanted to try to escape. It was getting dusk. The ten hung back, keeping the guard back a bit. When these fellows came to a bush they made a dash for it and got away. He said some of the civilian population in Germany were beginning to feel the pinch of hunger, and also said that Russian prisoners had died of hunger, and that the parcels were the only things that kept the British alive. I am giving you this little bit of information which is absolutely first hand, although I can't, of course, vouch for any of it. This man also said that when one would be alone with the guard he (the guard) would curse the Kaiser. But if two guards were together they would never say a word. They do not trust one another.

While in Holland he came across three men who had escaped in a chemical manure train by burying themselves in the manure. They had been working around the station and found out that this car was going to Holland.

One of the most interesting things I have heard was told me by a French-Canadian Lance Corporal. I cannot begin to tell it in anything like the interesting way he did, in his broken English. Anyhow here are the facts, and it goes to show the treachery of the Germans. In going forward the Lance Corporal passed a wounded German who asked for a drink. The Corporal signed that he had none and left the German behind. Just as he was getting down into a trench the German raised himself up and shot at him. The bullet hit his side, striking a clip in which he had five bullets; four of them were shot off and exploded, the fifth did not explode. This made the Corporal mad and he turned around and gave the German two bullets in the head. He showed me the German's hat badge where the bullets had taken off the edge of it, one on each side. It was really most interesting to hear him tell it. There are many more incidents of like nature I have heard, but no doubt you have also heard many long ere this.

Took a gas course last week. Everyone has to go through gas

now before going to France. It was quite interesting. It must have been terrible when those poor fellows got that first charge of gas in April, 1915, without any protection.

Well, as you are aware, I got married last December. Saw the notice in ORAL HEALTH and desire to thank you for the good wishes expressed in the Editor's Note. When I get to France I may be able to send you some interesting items occasionally but, of course, the censorship is very strict. I might add that the prevailing opinion seems to be that the Germans are going to try to hang out, believing that eventually the submarines will be the deciding factor.

Well, I guess this is all this time.

I remain, yours sincerely,

R. C. H. STAPLES,
Capt. C.A.D.C.
15th Canadian Field Ambulance,
Whitley Camp,
Milford, Surrey,
England.

P. S.—Capt. R. E. Stone, who practiced in Fort William, and who came over here with an Infantry Battalion, is in the C.A.D.C. His name has never appeared in any issue of ORAL HEALTH that I have seen. He has been on the Corps about fourteen months now. He is with the 16th Field Ambulance now.

R.C.H.S.

France, May 23, 1917.

Dear Doctor Seccombe:

I feel ashamed of my laziness in never having acknowledged receiving copies of "ORAL HEALTH" all these months. I nevertheless appreciate them very much. I do not always get the copies (occasionally one goes astray), but those I get I read and enjoy, and they help to keep me in touch a little bit with Canada and the things I have left behind.

I always have loads of work to do, excepting those occasions when it is impossible to do any at all, and then I do—none. When work is possible, which is nearly always, there is a lot of it. I operate for about five hours steadily every day, and when I start I do not leave the chair till quitting time as a rule. But you no doubt know all about working for a military dental parade.

It may be of interest to you to know that I, like many others who are not soldiers, was able to see the preliminary bombardment of Vimy Ridge, from a distance of three miles. And even so it was a never-to-be-forgotten firework display. You could feel Fritz panic by just watching the mad breaking out of colored flares all along the ridge. I believe, too, that I am the first British dentist to practise

our whole art in (*name censored*). (I am not there now). I do not feel that I am breaking censor's rules, as you all know perfectly well we were there at that time.

Captain Atkinson was returned to England sick just recently, and of course you heard about poor Leggo. I had been with him not very long before, in fact I performed some dental work for him.

I wonder if you could tell me, if you know, where some of '15 boys are now. I seem to have lost sight of most of them. I suppose a good few are in the C.A.D.C., and of course there are several over here. I should like immensely to be able to be back in Toronto and drop in at the Royal College one of these fine days and see some of the old friends and maybe sneak into the locker room and smoke a surreptitious half pipe and be invisible when any of the professors came along.

Now I must close. Please remember me to any of those I know about the College.

Yours very sincerely,

RICHMOND H. ATKEY,

8th Can. Field Ambulance, B.E.F.

Capt. C.A.D.C.

INFILTRATION ANAESTHESIA.—The infiltration method consists in inserting the one-inch needle over the root of tooth midway between gum line and apex, going under the periosteum until opposite the apex, and deposit from one-quarter to one c.c. of solution, being careful not to balloon the tissues, as the anesthesia is obtained by getting the absorption of the solution through the canaliculi of the bone to the nerve under the periosteum, and the smallest amount of solution (sometimes three minims will do it) is all that is necessary, if the technic is correct. Infiltration anesthesia can be used on ten anterior teeth of upper jaw and centrals and laterals in lower jaw successfully; the others are more or less doubtful as to results.—(*Dental Summary*).

CONDUCTIVE ANAESTHESIA.—The nerve supply of the teeth of the mandible would be blocked by depositing the solution in the ptergo mandibular space, or at the points where the inferior dental nerve enters the foramen in the mandible. The technic would be to palpate the retro-molar space, just back of the third molar, using index finger to locate internal and external oblique lines. Place tip of finger in the space with finger-nail slightly over internal oblique line. Swab tissue with campho-phenique, then sterilize with 5 per cent. iodine and aconite solution, area and finger-nail tip. Insert needle that has not been contaminated in any way since being filled with sterilized novocain solution, with bevel on needle towards the bone, one c.c. above line of teeth. Carry it back about the distance your judgment would suggest the foramen to be, or about two-thirds the length of needle; deposit two c.c. solution.—(*Dental Summary*).

THE COMPENDIUM

This Department is Edited by
THOMAS COWLING, D.D.S., Toronto

A SYNOPSIS OF CURRENT LITERATURE RELATING
TO THE SCIENCE AND PRACTICE OF DENTISTRY

SWAGED VS. CAST DENTURES.

NEW and improved methods of casting metals have resulted in the cast denture superseding, in a large measure, the older type of swaged bases. Some operators, however, still favor the swaged base, claiming that it is superior both as regards efficiency and economy. Basil Jones, D.D.S., has had considerable experience with both methods of preparing metallic bases, and recounts his opinion of them in an article published in the December issue of the *Commonwealth Dental Review*. This paper, aside from its particular interest for students of dental metallurgy, contains much of value for all prosthetic workers as well. The following features are recognized as being of advantage in the cast denture: (1) Time saved in construction. No sand moulds, discs and counter-dies are required, and the process is quicker and more direct in results. (2) A cast denture made from a good plaster impression will at once adapt itself to the tissues and at once shows excellent suction. In this way the operator can determine whether or not the completed denture is likely to be satisfactory. (3) In partial cases, or those having severe undercuts, a cast base can be prepared with less difficulty than would be the case if dies and counter-dies were necessitated. (4) Working with a wax model, it is possible to secure a differentiation of thickness in the finished base. Obviously, great difficulty would be experienced in attempting this with a swaged base. (5) A cast base requires no solder for attachments, etc., thus eliminating the danger of warping and effecting a great saving of time. (6) When carving up the wax model it is possible to extend the denture in a manner calculated to do away with the necessity for band support. More perfect results are obtained in this way than would be the case if the same thing were attempted in swaged work. (7) In the case of a close bite, a cast denture may be made to carry all the articulating surface required for a confined space.

So much for the favorable features of cast dentures; now a few of their disadvantages, taking the cast gold base as an example: (1) In casting metals it is always necessary to use more material than is

actually required for the completed case, consequently there is always the danger of wastage and the necessity of using an excessive amount of material. When making a swaged base, it is possible to obtain a pattern and with it secure the exact amount of material of a specified thickness, etc., required. In this way no surplus supply is needed. This is an important feature when precious metals are involved. (2) A cast denture requires more or less filing and finishing. This represents wastage of material. A cracking or giving of the investment material results in an undesirable thickness in certain portions of the completed case. And, again, the sprues must be removed and all traces of them obliterated by filing, etc. These operations must of necessity result in loss of material. (3) The certainty of an even distribution or uniform thickness of material is best secured by the swaging process than by any method of casting. Heated wax responds so readily to the slightest pressure that a thinning may occur without detection. When polishing the completed case these thin areas are readily exposed. The danger of such an experience when using metal of a uniform thickness of metal is certainly not great. (4) There is want of elasticity and tenacity in cast metals. This is due to the fact that in heating the alloy to a high temperature we lessen the tenacity of each of the constituent metals of the alloy and the benefit of such metals as copper and silver is lost. "Further, we lose the effect of annealing at a low temperature and rolling, which produces density and elasticity by a perfect union of the alloyed metals. I will admit (says Dr. Jones) that I have seen cast dentures extremely tough and elastic, but they have not that constant and soft elasticity which is produced by the rolling and swaging of gold. With regard to this, I would instance the old Butterfly partial upper dentures made some twenty-five years ago and carrying some eight or ten teeth; these plates, after many years' hard wear, seem to have simply moulded themselves to the mouth; teeth adjoining the artificial ones may have been extracted and recession of the alveolar ridge taken place, yet the form and elasticity of the denture has given it a firm adaptation to the altered mouth; new teeth may even be added to fill the places of those lost by extraction without affecting the fit of the denture. Will such an experience be shown with our present cast dentures? To my mind, platinum added to a cast denture produces brittleness and reduces the elasticity of the cast. On the other hand, one grain of platinum added to one dwt. of twenty-carat gold and rolled thoroughly and annealed gives the most elastic alloys." (5) If the wax pattern is uneven in thickness then the cast gold will contract unevenly during solidification and so result in an imperfect cast. Such a condition may result although the pressure used in casting is ample and evenly distributed. There is an added danger of the surface of the cast denture being richer in copper and silver crystals than the centre. Annealing and rolling would have an

opposite tendency, viz., the softer metallic constituents of the alloy would be distributed evenly among the other parts of the alloyed mass. (6) More difficulty is experienced in repairing a cast denture than would be the case with a swaged one. Application of solder to a cracked cast denture usually results in a recurrence of the trouble just where the repair has been made. This is particularly noticeable in cases where the cast metal is thin: A swaged denture may be mended by burnishing pure gold and uniting the parts with solder. (7) Some metals hold in a marked degree the property of occluding gases while in a molten condition. On cooling, the metallic mass liberates these gases and a condition of "spitting" or "vegetation" is apparent on the surface of the solidified metal. Small holes or "craters" may be observed sometimes with the naked eye, and when examined with the aid of a magnifying glass the whole surface will present an appearance of porosity. Buffing and polishing may conceal these imperfections somewhat, but they are still there and afford excellent places for food attachment. A cast denture does not keep its color as readily as does the swaged one because, as Dr. Jones claims, some of the alloyed metals, such as copper, may be forced to the surface and so come into intimate contact with the fluids of the oral cavity. This is a condition that is singularly absent in a swaged base. (8) There is a greater tendency to inflammatory condition in the tissues about a cast denture than with a swaged denture, observes Dr. Jones. This, he thinks, may be due to the copper coming to the surface of the cast metal and so getting into intimate contact with the tissues.

The author finds that "in the application of cast dentures to lower cases, we get our best results, for once the ridge has set we get a uniform hardness of tissue and process to receive a like uniform stiff structure. In lower cast dentures, if the cast is carried hard up on the necks of the teeth, I have found that the teeth either move with constant pressure or the tissue surrounding the necks of the teeth is pushed back; this may occur in swaged plates, but not to the same extent. To avoid this I have always adopted, with beneficial results, the plan of slightly easing the cast around the necks of the lower teeth."

Another point of interest is cited by Dr. Jones. Remarkable results, he says, were produced in casting partial dentures (upper) upon impressions taken in modelling compound. He refers to two cases—one carrying six teeth, another eight—in which "the fit to-day is better than when inserted four years ago; in both cases the tissue was extremely spongy and the teeth elongated." "The way I account for this," he says, "is that the softness of the tissue has given the rigidity of the plate its natural spring and seat.

INVESTING AND CASTING GOLD INLAYS.

In the *Journal of Allied Societies*, Dr. Conzett writes about casting and investing methods. He first of all suggests that we prepare our

own investing material, the formula for which is as follows: One part of plaster of Paris, three parts of finely pulverized silex and one-half part of Dixon's flake graphite. These constituents are mixed together thoroughly and then passed through an ordinary flour sifter three or four times. This preparation, the author claims, can "be made a good deal more cheaply than bought."

In preparing a mix for investment, the same quantities, by measure, of both investment material are used. "We are aiming to keep all of the processes at room temperature, so we use water that is about one hundred to one hundred and twenty degrees in temperature, according to the temperature of the room, for if we use water that is just the right temperature we shall find that the cold bowl, cold plaster, etc., will make the investment too cold, while the water being a little warmer than necessary will obtain a mixture that is just about right without the bother of complex paraphernalia to obtain the same result."

Preparatory to applying the investment material, the model is washed off with a little soap on a camel hair brush. The idea of this is to remove any material, such as oils, etc., that may interfere with the perfect adaptation of the investment material. "The model is now coated with the soft investment material, carefully excluding any bubbles and the investment completed in the flask. As soon as the investment is hard I begin to burn out, and am very careful that this is not overdone. More inlays are spoiled by reason of the overheating of the investment than any other way, for the plaster is disintegrated and made weak by too much heat, and under pressure of casting, gives ground to the force of pressure and a distorted misfitting inlay is the result. I have recently installed a one heat electric heater that is giving the greatest satisfaction. I leave the moist flask—that is, before the moisture has been driven off, on the heater that has had the current on for about a minute and then turned off, for five minutes, when I know that the investment is dry and ready to heat. The current is then turned on and left for ten minutes, after which the current is turned off and the flask set to cool."

Casting is done into a cold flask. The gold is melted with the oxy-hydrogen blow-pipe because of its quickness and the effect produced. The use of the ordinary blow-pipe would result in the heating up of the entire flask, and this is not desired.

Gold of 23k. is used where the inlay is subject to masticatory stress, and in all other situations pure gold is used.

If pressure casting is to be used then a force of five pounds is sufficient for the purpose and should be maintained for at least thirty seconds. Before casting, the gold is brought to a white heat and not allowed to boil.

After removing the inlay from the flask it is washed and pickled in hydro fluoric acid for a few minutes to remove all traces of calcareous material.

Oral Sepsis*

A Note of Warning with Regard to Its Treatment.

BY J. M. ANDERS, M. D., LL. D.,
Philadelphia,

Professor of Medicine, University of Pennsylvania

(The Author declares that this paper was written through "a desire to spare the medical profession the adverse criticism of the future, by a broader conception proper to the subject of oral sepsis in the present." The contention is made that "Countless teeth are being removed without justification, merely because physicians, usually following an X-ray examination, by amateurs in many instances, have so decreed" "The diagnosis of mouth sepsis should be made by a dental surgeon specially trained for this work, to whom, if there is any reason to suspect the teeth, the patient should be referred by the physician, and the combined judgment of the two,—physician and dentist,—should prevail as to whether these organs should or should not be extracted." The article is commended to the Dental profession. A conservative attitude is assumed that is worthy of careful consideration. The X-ray is just as essential to a modern Dental Office as is a root-canal instrument, but its place, value and limitations should be recognized at the outset.—Editor.)

AT the outset I wish to say that I fully appreciate the benefits to the human race of the recognition of local septic foci as a cause of secondary infections, both acute and chronic, and also the debt which medicine owes to the early contributions to the topic of focal sepsis by Miller, Rosenow, Billings, and Hartzell. I have also followed with sympathy and keen interest the development of our knowledge pertaining to the subject of the relation of oral sepsis to general or systematic disease. In an article (1) I referred to a group of cases in which a primary chronic septic focus in some organ other than the heart, e.g., the teeth, is present and may operate as a cause of pathological cardiac conditions, and further cited a case of chronic myocarditis associated with an infected tooth root, in which the removal of the latter was followed by a symptomatic cure of the cardiopathic patient. Like instances could be multiplied indefinitely from the literature, if space permitted here. The list of acute and chronic diseases which may be caused by focal sepsis is of great length, including some of the commoner complaints, such as endo-

*Read before the Philadelphia County Medical Society, December 27, 1916.—N.Y.M.J.

carditis, myocarditis, pericarditis, arthritis, arthritis deformans, appendicitis, cholecystitis, neuritis, nephritis, thyroiditis, gastric and duodenal ulcer, furunculosis, and many others.

The tooth root theory of diseases, however, is not yet accepted by some, at least, of the more progressive dentists, who contend that the mouth is amply provided with defences, and that in septic states nature is, as a rule, equal to the situation. Says Percy R. Howe, D.D.S. (2): "It is our office as dentists properly to attend to root canal filling; to see to it that our patients keep their mouths clean and hygienic; and I believe that the arthritis and endocarditis that occur in our patients are not the result of faulty root work nor lack of cleanliness, but proceed from other and deeper seated causes. What is the significance of a filthy mouth in a hospital patient? It is significant of illness or bodily derangement. Clear up the filth, turn the patient loose, and the filth will return. Clear up the filth—pyorrhea if you choose—and give the patient good hospital care, and the filth will recur, or not recur, just in proportion as the patient responds to the scientific treatment which his systemic condition receives."

We are obviously in need of higher average standards of knowledge on the subject of the relation of diseased tooth roots to secondary systemic diseases; and this is particularly true of the major portion of the dental profession. On the other hand, physicians should be cautious not to diminish the masticating surface of the patient without reliable scientific evidence of an existing necessity for so doing. The reasonableness of my position in this matter will be, I trust, conceded when it is learned that within the past six months not less than six leading dentists have declared to me that countless teeth are being removed without justification merely because physicians, usually following an x-ray examination, by amateurs in many instances, have so decreed. It seems to me that such a state of things must tend to arouse the most ardent activity on the part of the dental profession in opposition to this rapidly growing custom among physicians. To advise the extraction of teeth that are merely suspected of being septic, will surely prove the ultimate disappointment and chagrin of the medical profession.

Dr. E. T. Darby, an acknowledged authority, informs me that he is strongly of the opinion that many teeth are being extracted which should be saved by judicious treatment, but he also contends that it is better to sacrifice a tooth that has an incurable abscess than to jeopardize thereby the health of the patient. In a personal note to the author Dr. J. A. Woodward, a prominent dental surgeon, says: "The possibility of a misleading x-ray picture of abscessed conditions about the roots of teeth and the fact that a large percentage of these abscesses can be made to heal make it much the best practice to refer all cases of suspected oral sepsis to a competent dentist before ordering

the extraction of teeth." Surely to our progressive dentists must be accorded the technical skill and knowledge necessary to advise regarding and to treat dead, filled, or capped teeth which may or may not be septic. Hence, before peremptorily requesting that the teeth of their patients be sacrificed, physicians should seek a consultation with a specially skilled dentist. It would appear that an amazingly low estimate is placed upon the value of human teeth by a profession that knows, or should know, the importance of a good masticating apparatus to the digestive function—to health.

In well authenticated cases, in which one or two teeth were the seat of peripheral infection, physicians have gone so far as to give emphatic directions to the effect that all remaining teeth be extracted. For example, one of Philadelphia's best known specialists in extraction was requested by a physician to pull out all of a certain patient's teeth, twenty in number, but he courteously, though firmly, declined to do so. In this case, an x-ray examination failed to show anything pathological, except that one of the wisdom teeth was impacted.

Perhaps the needless and ruthless sacrifice of teeth has been greatest in patients suffering from arthritis deformans. With respect to this class of subjects, Dr. J. Howard Gaskill has written me as follows: "I have seen several cases recently where all the teeth have been extracted, and where it not only failed to help the arthritis, but actually made the condition worse." He continues: "It may be of interest to you to learn of this case:

Case. "Mrs. X. For several years there has been a gradual development of arthritis deformans, so that at the present time there is a complete loss of motion at hips and knees; she still has some use of arms and hands, but there the trouble seems to be progressing. In view of the work of Rosenow and Hartzell, her teeth were suspected by the attending physician, and careful radiograms were taken of her masticating apparatus, but there was not a spot in the mouth indicating that the teeth could be the source of the trouble.

"Such being the case, I feel that we must be careful in attributing too much to dental disturbances."

An investigation has revealed the fact that the offices of not a few dentists are truly overburdened with x-ray plates, which they are supposed to respect, often against their better judgment. In connection herewith, it may be pointed out that the results obtained by expert roentgenologists from an examination of teeth have shown much faultiness in operative work, and, as a consequence, have brought about the exercise of greater care and thoroughness on the part of dental surgeons in the treatment, and filling, of root canals. Says William M. Wright, D.D.S., in a recent article (3): "Basing conclusions on the examination of a great many Rontgen ray pictures, we believe it

is safe to say that the great majority of these abscesses are found in the apices of roots, the canals of which have been imperfectly filled."

In cases of secondary systemic infection, our present day views of treatment demand the removal of the focus or foci on which they depend. A cure, or permanent improvement even, is not possible by pursuing any other course, but the physician should be thrice certain that the teeth are septic and not amenable to skillful dental management before he advises their extraction. Moreover, it is to be recollected that in a certain percentage of such instances there are multiple foci of infection, and while this is often true of the teeth, it not infrequently happens that additional and larger ones harboring more virulent microorganisms are to be found elsewhere, e.g., in the tonsils and sinuses, and unless these be removed, failure to relieve the systemic infection is an inevitable result.

The fact that chronic septic foci are exceedingly difficult to diagnose in the majority of cases needs to be emphasized. A single examination, however carefully made, fails to clear the diagnosis in many cases at least. Periapical infection and abscess offer the greatest difficulty in this respect. Here, even an x-ray examination may fail to render reliable aid. In these cases, the dental specialist investigates the condition of the pulp canal from apex to the extreme base. Should this exploration still leave the case in doubt, he should take a further step and aspirate the periapical space under strict antiseptic precautions and culture the withdrawn material. If now one of the salivarius group of streptococci, e.g., the viridans, hemolyticus, or mucous, be discovered, then the diagnosis is settled.

I quite agree with Daland (4) that the diagnosis of mouth sepsis should be made by a dental surgeon specially trained for this work, to whom, if there is any reason to suspect the teeth, the patient should be referred by the physician, and the combined judgment of the two—physician and dentist—should prevail as to whether these organs should or should not be extracted. To assist them in arriving at a conclusion, a roentgenogram is always required. Physicians and dentists must work together to obtain the best results in such cases. Attention cannot be too strongly drawn to the fact that before consulting an expert dentist, the physician in charge of a suspect must by a process of exclusion eliminate all foci of infection other than those that may be present in the mouth.

In preliminary examinations, the advice of a competent nose and throat specialist is always necessary. Without observing this precaution, either before or after consultation with a skilled dentist, with a report of the results, an unfair advantage is taken of the dental profession. From the foregoing facts, it appears to me that a plea for great care and caution in the diagnosis of chronic septic foci and

equally great conservatism in the matter of sacrificing the masticating apparatus is timely.

Within the memory of most readers, time was when ovaries were removed to an unwarrantable extent. It is my firm belief that one day not far distant the indiscriminate resort to tonsillectomy for chronic septic foci, including cases in which no, or supposed slight pathological alterations in these organs exist, will be condemned by the medical profession. The pathfinder who gives forth what is mature, although new, and sound as an indication for surgical procedure, often lives to regret that others coming after and oppressed by a narrower range of diagnostic skill, advocate and practise more or less indiscriminately the operative procedure. The latter finally precipitate a total loss of the original professional concept of the scope and purposes of the operation in question. This condition of things indexes an unfortunate state of mind on the part of the medical profession which is ever in need of stabilizers who will balance and model sane views of surgical procedures having vogue.

If perchance it be thought that I have stated the case with too much fervor, let it be understood that it has not been my purpose to attempt to disparage the importance of these latent, chronic foci as a cause of secondary systemic infection, nor to depreciate investigations in this new and promising field of endeavor, but to utter a note of warning with a view to lessening what I believe to be an unwarrantable and often reckless sacrifice of the masticating surface.

In conclusion, let us build our diagnosis of chronic septic foci broadly and securely on general pathology and bacteriology, which is the one sure foundation for both diagnosis and treatment, and thus save ourselves from the invasion of recklessness in the removal of teeth and other organs.

It is a false and dangerous doctrine that helps a physician either to ignore or undervalue the importance of a normal masticating power. Granting that a certain percentage of loss of dental surface is inevitable as the result of recent advances in oral pathology as related to general medicine, the weight of our influence should ever be thrown against the present day tendency to underrate the physiologic significance of an efficient denture by a too great readiness to extract teeth.

Lastly, this paper was dictated by a desire to spare the medical profession the adverse criticism of the future, by a broader conception proper to the subject of oral sepsis in the present.

REFERENCES.

1. ANDERS: Pennsylvania Medical Journal, January 16, 1917, p. 263.
2. HOWE: Journal of the Allied Dental Societies, September, 1916.
3. WRIGHT: Pennsylvania Medical Journal, November, 1916.
4. DALAND: New York Medical Journal, June 19, 1916.

ACTIVE SERVICE ROLL

Complimentary copies of ORAL HEALTH will be sent during the progress of the war to all Dental Graduates on active service whose army address is known.

Honor Roll

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of CANADIAN DENTISTS

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HELPFUL PRACTICAL SUGGESTIONS FOR PUBLICATION, SENT IN BY MEMBERS OF THE PROFESSION, WILL BE APPRECIATED BY THIS DEPARTMENT

GOLD CUSP FOR VULCANITE DENTURE.—In case of too limited space for porcelain teeth, the tooth of the series desired may be mounted in the swaging ring and a piece of pure gold of 34 gauge adapted directly to the porcelain tooth. Fill with solder, and by the addition of a loop, a perfectly accurate replica of the occlusal surface may be rapidly secured.—*W. E. Cummer, D.D.S., Per I. H. Ante.*

CARBORUNDUM DISCS.—In using carborundum knife-edge discs to trim down a tooth preparatory to crowning, they may be rendered "safe" for the adjacent tooth if a sand-paper disc of same size be attached on the screw mandrel with the stone, the varnished side being outermost.—(*Dental Record.*)

TO REMEDY MARGINAL IMPERFECTIONS IN INLAYS.—Sometimes for good and sufficient reasons, it becomes necessary to seat an inlay that is good in every respect excepting a slight flaw or fault in one of the margins. This can very easily be fixed with a little gold foil. Have the surface of the inlay clean, grasp it firmly in a pair of tweezers, flux slightly and heat in a blue flame to a dull red. While at this heat a small pellet of uncondensed foil is stuck to the part of the margin that is shy. Then the inlay is placed in the cavity, allowing the foil to condense against the cavity wall. When the inlay has been seated with cement the margins will be without the former flaw.—*Pacific Dental Gazette (Dental Record.)*

EXTRACTION OF ABSCESSSED TEETH.—There is no more reason why an abscessed tooth should be retained in the jaw simply because the face is swollen than there would be to allow a splinter of wood to remain in the hand, a piece of glass in the foot, or a piece of steel in the eye.

TO SECURE EXACT OCCLUSION.—For full sets of teeth, it is often difficult to get the occlusion exact and "flat." Some prosthetists take emery flour and mix with oil. After remounting on the anatomical occluding frame they smear the grinding surface with this, then work the sets and gradually wear the occluding surfaces until they close "flat."

ORAL HEALTH

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Vol. VII.

TORONTO, JULY, 1917

No. 7

EDITORIAL

Physical Standard, Canadian Army Dental Corps

THE physical standard for the Canadian Army Dental Corps has been reduced and will be the same as that laid down in C.E.F. Order No. 3 for February 1st, 1917, for Construction and Forestry Battalions. (H.Q. telegram, dated 4-5-17).

(a) *Age*—Upper age limit—48 years, but the apparent age is also to be carefully noted in those near the lower age limit. Particular care must be taken to reject those who, while stating, or affording proof, that they are over the lower age limit (18 years), present, nevertheless, a physical development below the normal for that age period.

(b) *Height*: The minimum height accepted is 4 feet 11 inches.

(c) *Chest Measurement and Expansion*: These must be proportioned to the height.

(d) *Standard of Vision*: Men can be accepted who (1) can read D-200 at 20 feet, with the right eye, without glasses, and not less than D-80 with the left eye, at the same distance without glasses, or (2) whose vision can be raised to the standard by the use of glasses, or (3) who have lost one eye, or the sight thereof, but whose sight has not been lost as the result of injury or progressive organic disease within the last three years, the sight in the other eye being not less than

D-80 at twenty feet without glasses, or (4) who have suffered from squint since childhood, provided that neither eye has a visual acuity of less than D-80, at twenty feet, without glasses.

(e) *Hearing*: Deafness in one ear shall not prevent acceptance, provided that the hearing of the other ear is normal and that the deafness is not due to existing disease (Otitis Media, etc.).

(f) *Loss of Fingers*: Men may be accepted, who have lost one or two fingers, if the examining medical board considers that the recruit is not thereby incapacitated from manual labour.

(g) *Loss of Toes*: Men may be accepted, who have lost one or two toes from either or both feet, provided that the great toes are intact.

(h) *Flat Foot*: A moderate degree of flat foot will not constitute cause for rejection. Care is to be taken to determine whether the condition is genuine flat foot, (i.e. due to giving way of the arch of the foot) or not, either by X-Ray examination or by the test of a five mile march.

2. Whenever a man is passed for service, who has some physical defect, the nature of that defect, or minor disability, and its apparent extent, must be noted in full detail upon the Attestation Paper.

3. No man is to be accepted who affords a history or evidence of (a) Epilepsy, (b) Tuberculosis, (c) Insanity, or (d) Acute Rheumatic Fever or Acute Endocarditis.

Special Service: Modifications of the ordinary standard of fitness, which may be noted with reference to the examination of men for Home Service only, in Canada, the following may be accepted:

1. Standard of height: Minimum 4 feet 10 inches.

2. Age: Men between 45 and 48 years of age, provided they are otherwise physically fit according to the overseas standard.

3. Chest Measurement: Minimum 31 inches, but the lungs must be normal, and family history free from tuberculosis. (In case of doubt, a certificate from the family physician should be secured.)

4. Vision: (a) Any man whose vision may be brought up to normal in both eyes, by the aid of glasses, provided the visual defect is not due to existing disease. (b) Men who have lost one eye or the sight thereof, but whose vision without a glass in the remaining eye is normal (provided the normal eye is the "Shooting" eye, left or right.)

(Squint or any morbid condition of the eyes or lids of either eye, liable to the risk of recurrence or aggravation, will cause the rejection of the candidate).

N. B. Glasses will be provided free and replaced, if required, at public expense once every twelve months.

5. Varicocele or Varicose Veins, not of a degree to render unfit for Sedentary occupations.

6. Flat Feet, of slight or moderate degree, not sufficiently marked to render unfit for office work.

THE FOLLOWING WILL NOT CONSTITUTE UNFITNESS.

1. Loss of one or two fingers on either hand, excepting thumb or forefinger, provided such loss does not interfere with his ability to do the work at which it is proposed to employ him.
2. Loss of any toe or toes, except the great toe.
3. Loss of one foot or leg, in invalided soldiers, who can wear and use an artificial limb. (These men may be accepted for clerical or other suitable duty.)

The above regulations are compiled from "Rules for Inspection of Recruits, 1916," amended in accordance with H.Q. 1982-1-41, of 21st of July, 1916, and H.Q. 600-10-41, of 22nd January, 1917, also H.Q. 297-1-31 *re Special Service*.

ORAL HEALTH is indebted to Major Thompson, A.D.D.S., M. D. No. 2, for details of these changes in the regulations. By virtue of these relaxations from the ordinary physical standards of the militia, and made applicable to recruits or officers who desire to join the Canadian Army Dental Corps, the C.A.D.C. will be less limited in its choice of officers and will thus be able to secure for the dental services many efficient officers who could not otherwise pass the required physical examination.

Office Plans and Decoration

A FEW days ago the Editor received a specimen portfolio of "Suggestive Decorative Color Schemes," intended for gratuitous distribution to members of the dental profession. The average dentist has not had the training nor has he the natural aptitude to decide the best decorative effect for the walls of his office. The suggestions referred to, assist in the decoration of a dental office in a simple and artistic manner, and have been issued by the Ritter Company, thus augmenting their earlier booklet "Fifty-five Modern Dental Office Plans." The members of the dental profession who secure copies of these booklets will certainly profit by them and will, undoubtedly, appreciate their suggestive value in the better arrangement and decoration of the office in the interests of both efficiency and greater attractiveness.

Vacancies in School of Dentistry

APPLICATIONS will be received by the undersigned up to September 1st, 1917, for the following vacancies on the Staff of the Dental College: Professor of Dental History, Lecturer on Art and Color, and Librarian and Curator of Museum.

W. E. WILLMOTT,

96 College St., Toronto.

Secretary R.C.D.S.

ORAL HEALTH

A JOURNAL THAT STANDS FOR THE "OUNCE OF PREVENTION," AS WELL AS THE "POUND OF CURE"

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Some Phases of Root Canal Work*

J. MILTON JONES, D.D.S., VANCOUVER.

A REVIEW of the programs of dental conventions for the last couple of decades reflects the many waves of enthusiasm, often amounting to a mania, which have taken the profession by storm. Twenty years ago, gold foil operations, involving a test of endurance for both patient and operator, consumed most of the time of the convention. Amalgam fillings were to be raked out and replaced by the precious metal. Then came the porcelain era, and the controversy at the dental meetings was as to the relative advantages of high or low fusing porcelain. A few years later came the hey-day of excitement with the advent of the cast gold inlay and the silicate cements. The operators, in their joy at the thought of easier methods, junked their pluggers and scrapped their furnaces. So, also, in our efforts to relieve pain, we relegated our cataphoresis outfits to the top shelf and took up the high-pressure syringe, like a child with a new toy, until along came the wave of gas and oxygen for analgesia. The dentists had barely paid their last instalments on these costly machines when they were shoved back to the store room to make way for conductive anesthesia.

How the pendulum does swing, and how history does repeat itself! Twenty years ago, much extraction was done; then we went through the stages of conservation to an extreme—everything must be saved. Some dentists even boasted that they hadn't a pair of forceps in the office, that they could save everything which couldn't be extracted by the fingers. The very result of this ultra conservatism has been

*Read before the annual meeting of the British Columbia Dental Association, Vancouver, B.C., June 19, 1917.

that we have arrived back in the cycle to the point where forceps must be freely used.

This cursory review of past phases of dental activity has been made in order to place in its proper perspective the present wave of research, viz., root canal operations. That the field confronting us is probably the most important which has ever engaged our attention cannot be doubted. Our previous spasms of activity in other lines have come from within ourselves, and of our own initiative, but the present one is being forced upon us by our medical friends. The diagnostician, having vainly ransacked the organism in his search for the causes of certain obscure lesions, has insisted that the trouble lay in the field presided over by the dentist. He has discovered that cases of rheumatoid arthritis, endocarditis, duodenal ulcer, and nephritis often have their seat of origin in a focal infection at the root apex of a tooth or from a pyorrhoeal pocket; hence he is calling upon the dental profession to check up its work on pulpless teeth. To do this with any degree of certainty, we have had to utilize the X-Ray. What this agency has revealed to us recently is a sight to make the angels weep. We find our root canal work has been deplorably faulty and imperfect. We have been playing with a truly surgical operation in the thoughtless belief that it was a merely mechanical procedure in the same class as the insertion of a filling. Now we are all brought up with a jolt, and I hope we realize the responsibility it involves. The sooner we realize that when a patient presents an exposed or putrescent pulp we are faced with a truly surgical operation, the better it will be for the health of humanity. Let us eradicate from the public mind the inherent notion that the so-called "killing the nerve" is a mere incident to the filling of the tooth and all included in the price of the filling. We must put it right up to the patient that a surgical operation must be performed to remove the contents of the root canal, leave the canal in an aseptic condition, fill it to the apex and no further with a bland material so as to prevent infection or reinfection of the apical tissues, and then, and *only then*, to restore the crown to function.

We must explain that this will take time and patience and skill; that it cannot be done blindly, but must have the light of the X-Ray thrown upon the operation at different stages, and even then be kept under observation ever after; and that incidentally this will entail an expenditure commensurate with the importance of the work undertaken; also, that unless it is to be done properly, it had better, *far better*, not be attempted. Unless a proper aseptic and mechanically correct root filling operation is contemplated, it were much better for all concerned that extraction be made at once, for, to quote a Biblical observation, "If thine eye offend thee, pluck it out, for it were better

to enter the Kingdom of Heaven with one eye, than having two eyes to be cast into Hell."

Having extirpated a pulp, which, I trust, has been done surgically, rather than by that dangerous method of arsenical poisoning or even by pressure, unless the pulp is known to be aseptic, the dental surgeon is confronted with a problem. He will realize that it is peculiar to his field, for nowhere else is the surgeon called upon to try and induce the healing of a wound, open to the exterior, and with nothing but mesoblastic tissue at his command. It is a surgical impossibility. The best that can be hoped for is that this stump of mesoblastic tissue can be induced to *tolerate* a bland foreign substance. It is simply a toleration at best, and, in the majority of cases, is unsuccessful. It should be examined periodically by the radiograph to see if the toleration still exists. The moment there is evidence of trouble, one of two surgical methods must be undertaken—either root resection or extraction. Ionization of these apical lesions also promises good results, but it may yet be considered in the experimental stage.

Having decided to carry out the operation of root treatment, what are the desiderata?

(1) We must remove all traces of soft tissue from the canal right to the cementum at each foramen.

(2) No injury is to be done the pericementum. It must be left in a healthy state of function, attached to the cementum.

(3) No infection shall be introduced or left in the canal.

(4) The canal shall be sealed hermetically, both apically and coronally by a bland permanent material.

How far you have succeeded in this let each ponder in his mind. You who have left the pulp in canals not easy of access, depending on a mummifier to take care of it, may well be filled with shame, for did not your patient entrust you with her health, and did you not (thoughtlessly, it is true, but none the less thoroughly) seal up an incubator in that patient's anatomy ready to be inhabited by virulent organisms, either left there by yourself or lodging there by way of the blood stream? Did you not virtually prepare a time fuse for the possible destruction of that patient at some later time when conditions should become favorable? Has not already for many of us, six feet of earth and a marble slab covered the victims of our foolhardy tinkering?

These are pertinent questions, and if they cause us to *pause* and *think* and *resolve*, then this cursory survey shall not be in vain. The field is so big and so important that I dare not go into further detail. Others on the program will go more thoroughly into technique.

Permit me to throw some slides on the screen which will bring to your vision some of the devastation of our reprehensible work in the past, and perhaps the sight of it will revolutionize your previous methods of canal work.

The Daily Diet*

*Miss A. L. Laird, Associate Professor of Household Science,
University of Toronto.*

(This writer has shown in a striking manner that the daily dietary of school-children is one of our big national problems,—“not to relieve ‘acute hunger’ but to relieve ‘chronic malnutrition’.” Miss Laird refers to the large percentage of Canadians who have been rejected as physically unfit for military service, and argues that “bad feeding” is the chief cause of physical inefficiency. As a matter of record, a large percentage of men “rejected” were suffering the results of Dental disease. Doubtless it is “bad-feeding” that has resulted in the present serious dental conditions.—Editor.)

THIS is a very broad subject and one that may be considered from many standpoints. We will limit our discussion of it to some phases of the problem as related to our elementary school children.

The daily diet of our school children is of vital concern if our country is to prosper. If we are to have a strong, efficient race, we must see to it that our children are well nourished. Both the mind and the body are undergoing fairly rapid development during the school age, and malnutrition at this time often tells on the whole after life. In appearing before a Royal Commission in England, Hutchison gave it as his opinion that the most critical time—after passing infancy—as far as nutrition was concerned, was the school period between ten and fifteen years of age.

Just after the Boer war, England's eyes, as a nation, were opened to the great importance of efficiently feeding growing children. When, in 1902, Major-General Maurice announced that only two out of every five men who applied for admission to the British army were “physically fit,” England was naturally greatly exercised, and it was said quite freely in the United States that England was facing the problem of national deterioration—that the end of her supremacy had begun, and that she was repeating the history of Rome. As a result of this startling condition of affairs, the British Parliament appointed a Royal Commission to inquire into the physical training in the schools and to try and discover why the men were physically unfit. After examining very carefully and very thoroughly into the cause of this physical unfitness, the conclusions reached were that there were at least three factors that affected the vitality of the nation—housing, occupation and feeding, and that the most important one was feeding. They examined the physical training from

* Paper read before Home Science Section of O.E.A.

the Universities down to the elementary schools, and found it all right; but found many children, on account of malnutrition, not able to profit by it, and in some cases they found that while the physical training was good in itself, it was doing actual harm. Further commissions were appointed; the voluntary work being done in the feeding of school children was studied and found inadequate to meet the need, and as a result of all these investigations the "Provision of Meals Act" was passed by the British Parliament in December, 1906. This Act provided that school authorities might appropriate money for school lunches, and it applied to England and Wales. Scotland has her own School Feeding Law. It is worth while to note that this was the first bit of legislation growing out of the alarm regarding the physical deterioration of the people—other legislation followed.

The problem that faces one is not to relieve "acute hunger," but to relieve "chronic malnutrition." This school feeding is only touching the fringe of things, and it by no means insures proper feeding for the children it reaches; but that it has proved a help is shown by the action of the London County Council at the outbreak of war in August, 1914. The elementary schools of London had closed Friday, July 31st, for holidays to September 24th. The following day Germany declared war, on August 4th, England declared war on Germany, and on Thursday, August 6th, the London papers announced that the schools would re-open Monday, August 10th, and quite definitely stated that if there was to be war, the feeding of the children must be looked to, and the only way to do it was to bring them back to school.

When one picks up the daily paper here, one is struck by the large percentage of our men who offer themselves who are rejected as physically unfit, and if we accept England's finding as the cause, the most important factor, for this extremely serious condition of affairs is "bad feeding." This "bad feeding" not only affects the physical well-being, but the mental and moral as well. Insufficient or over-nutrition has as much to do with breakdown at school as overstudy has. Clearness of the brain to study depends on proper nourishment, and, no doubt, the so-called stupidity or backwardness of many children in the public schools is simply the result of neglect and under-feeding. If malnutrition during the growing period means a handicap for the rest of life, surely it follows that it is of vital importance to any nation that its growing children be well fed. The daily dietary of our school children is one of the big problems.

Let us consider the causes of malnutrition. Generally speaking, they may be classified under three headings: ignorance and thriftlessness; poverty; criminal neglect. No doubt some cases of malnutrition are due to criminal neglect, and many due to poverty, but many,

many more are because of ignorance and thriftlessness. Ignorance is undoubtedly the main cause. Investigators have found malnutrition especially marked among school children, that the people understood more about feeding the younger children, and in many cases children going to school were left to shift for themselves.

As a result of ignorance or poverty, we may have insufficient food, and this no doubt is the cause of much malnutrition, but unsuitable food is probably responsible for many more cases.

In many of the poorest homes the diet is mainly one of bread and tea and highly seasoned canned goods. In many homes, where poverty is not a cause, the mother will say, "The father is the principal bread-winner and his strength must be maintained at all costs; he must be considered first," and the result is food that he likes is prepared and forms the children's diet. The food may be wholesome, but unsuitable for children.

Food may be unsuitable because of kind. It is very frequently lacking in cell-building elements. Again, it may be unsuitable because of improper or poor cooking. Badly cooked food is said to cause more disastrous results during youth than at any other period of life. Without good cooking, indigestion and constipation or diarrhoea result, and a vast amount of strength is wasted in the efforts of nature to overcome the difficulties placed upon her. Not only is there present discomfort and loss of power, but often organs are permanently injured. "A poor dinner well cooked is better than a good dinner indifferently cooked."

Another cause of malnutrition, due to ignorance, is irregular meals. It is said that in the homes of many work people the children never sit down at the table. They go and get a piece when they want it, and stand up or walk around while eating it. Regular meals properly distributed over the twenty-four hours are necessary.

Again, malnutrition may, through ignorance, be due to want of sufficient sleep. Taking the results of the respiration calorimeter experiments, a grown person requires, when in bed asleep, $\frac{1}{2}$ calorie per lb. per hour and $\frac{3}{4}$ calorie per lb. per hour when awake and sitting up but doing nothing, while the amount increases rapidly when muscular work is done. The child's requirement is more per lb. of body weight, so that if the child stays up two or three hours longer than it should, the fuel requirement is considerably increased. It therefore follows that lack of sufficient sleep is especially bad for undernourished children. Then, too, a child's nervous system requires rest and quiet. For instance, moving picture shows in the evening are not conducive to rest, or sleeping in a room with four or five others may be disturbing. The lack of fresh air is another contributing cause. We need plenty of fresh air in order to make the best use of the food we eat—fresh air during the day time and also at night.

Through ignorance of all these points and of sanitation, we have malnutrition and various kinds of disease, and the question is, what can we, as Household Science teachers, do to improve this condition of affairs?

If ignorance is the main cause—ignorance of the needs of the body, of food values, of how to prepare foods, etc.—it follows that if we are going to permanently help matters, we must educate the people, we must make an impression on the home, and raise the standard of living. Something toward this end can be done through the school.

In England they found that children had to be taught to like simple, wholesome food. For instance, in one special experiment in Bradford, forty of the most needy children were taken and given breakfasts and dinners. Only one child out of the forty had ever eaten oatmeal, and that one was a Scotch child. The first day thirteen refused to try the oatmeal, the second day all but two tried it, and from that on all enjoyed it and were not pleased if porridge was not served. Similarly, in one of the London schools, when porridge was first introduced, they had great difficulty in getting the children to taste it, but after a little time it became very popular, and a lady made inquiries from a number of grocers in the neighborhood and found that their sales of oatmeal had greatly increased. The serving of oatmeal at the school breakfast had led to the introduction of this food into many homes. We should definitely try to improve home feeding through our work in the schools. This, I think, should be a definite aim of cookery in the public school, and it seems to me the work at present fails to accomplish what it should in this respect.

If cookery is to be taught for its value as handwork, why include it in the public school curriculum? Other subjects that require less equipment would do just as well. If cookery is to be taught merely as a cultural subject and for its mental training, why add another subject to an already overcrowded curriculum, and particularly at a time when the children are too immature to reason out the why and the wherefore?

If the aim is merely to learn to cook a few odd dishes, it surely has no place on the public school or any other curriculum. Such a method of teaching the subject encourages bad dietetic habits rather than good ones. As I said before, the English Commission appointed to inquire into the causes of physical deterioration found in some schools the physical training, while good in itself, did positive harm on account of the condition of the children. And we should face the fact that it is possible to teach cookery as the making of dishes, and do harm rather than good by teaching things that may be all right in themselves, but entirely out of place as far as the children in the schools are concerned. To me there is only one end that justifies the introduction of cookery into our public schools, and that is the

definite aim to increase the efficiency of the child, and through the child, the nation. If it is made, as Mrs. Richards used to say, the "4th R"—Right Living—then it has a reason to be; but if not, its place is not in the public school, but in the high school, where the girl is more mature and can understand the subject matter better. This phase of the work is introduced in our public schools mainly because such a large per cent. of our children never get to the high school, so that if the help is to be given it must be in the public school.

We may help the child by teaching the preparation of foods suitable for growing children, and, except in very rare cases, omitting dishes they are better without. The dishes taught should be simple and adapted to the financial conditions of the children's homes. The dishes should be taught as an integral part of a meal. It is the meal that is the important thing for these children. A logical study of foods can be better given in the high school. Whenever possible, we should have the actual preparation of simple meals.

Another very important point is, that the dishes taught should be repeated over and over until the children become proficient. One does not teach the multiplication tables by going over them once, and we do not expect a child to learn anything else by having one lesson on it; but apparently many Household Science teachers think this possible in cookery. They teach a lesson, say on bread, and consider that they have taught breadmaking. This is unwise from whatever point you view it. It is against all the principles of teaching, and makes the children restless—they are always wanting something new. Children will repeat the same or a similar dish over and over if presented as a part of a meal.

The question of expense is important. It is a farce to attempt to teach practical foods if one has so little to spend that the children cannot get practice. On the other hand, we must remember that it is not encouraging thrift, and may do harm to teach poor children something beyond the means of the family. For instance, eggs, even at 36 cents a dozen, come to 4 cents for a 100 calorie portion. This is quite beyond the reach of poor people, and the dishes taught should be suitable, with respect to the financial condition of the homes of the children. I grant that there is a minimum, and an ever increasing minimum, necessary for efficient feeding, but there is also the wise spending of what one has, and the Household Science teacher should estimate what is a fair amount for the average family, in her school section, to be spending on raw food materials, and govern her choice of dishes accordingly. The children should be taught to buy wisely, and to make the fullest possible use of what is bought. The care of food materials, the use of leftovers, etc., must not be neglected.

Having noted the importance of the daily diet, and of the teacher keeping this end in view, let us briefly consider the foods suitable for

school children, and especially for the period from eight to twelve years of age.

Milk is one of the best foods for children of all ages. A factory inspector in England, after careful and continued measurements of factory children between the ages of thirteen and sixteen, found that those who had milk for breakfast and supper grew four times as much as those who used tea or coffee. Without milk the diet is likely to be lacking in lime, and other body-building material, and also may be lacking in certain substances needed for growth—growth vitamins. One and a half pints of milk a day can be combined until the full physical growth is reached. The milk may be taken as a beverage, on cereals, in milk soups, in simple desserts, as rice and other farinaceous puddings, with milk, custards, simple ice cream, such as milk sherbert or custard ice cream. Ice cream made from thick cream is too rich for children.

Cereals should form a part of the daily diet. Thoroughly cooked porridge, made from the whole grain, such as rolled oats or rolled wheat, provides needed mineral matter and cellulose. Ready-to-eat cereals should be used only very occasionally. In an experiment in Sheffield, England, they took three groups of children from the same school. The first group came from better homes and were not given school breakfasts but were weighed regularly. The average gain per child per week for these children, having all their meals at home, was 2.09 ounces. The second and third groups were children from poorer homes, and they were provided with breakfasts at school. The children in the second group were not given porridge, and their average gain per week was only 1.58 ounces; while the third group, whose homes were similar to those in the second group, were given porridge, and their average gain was 3.31 ounces a week—a considerable gain over the children who came from better homes.

Bread should be served as stale bread or crisp toast, and the child taught to masticate it thoroughly. Fresh or hot breads do not belong in the child's diet, and even after twelve years of age it is advisable to use them sparingly. Crusty rolls and small cornmeal or Graham muffins (small to increase the proportion of crust) are the best forms of hot breads. It is considered advisable to omit griddle cakes, waffles and tea biscuits until the child is at least fourteen years of age.

Fresh fruits and vegetables are very important. Without them the diet may be lacking in base-forming elements, in mineral ingredients, and in cellulose. Any mild, raw or cooked fruit may be used, but it is wise to avoid very acid fruit or to use it sparingly. The vegetables should be thoroughly cooked in such a manner as to avoid the loss of important constituents, and should be served in a simple manner. Rich sauces should be avoided.

If plenty of milk is used in the diet, there is no need for a large

amount of flesh food, and there are serious objections to a too liberal amount. A very small serving is sufficient, and the meat should be simply prepared. Rich meats, as pork and dried meats, should be avoided. Eggs cooked in a simple manner—never fried—are an important food, and should be used when possible. Unfortunately, their price is frequently prohibitive.

The most desirable desserts are bread and cereal puddings, blanc mange, junkets, custards, and occasionally ice cream. It is better to omit pastry. When pastry is used, the baking of the crust is very important. Experiments indicate that the thorough baking of the crust makes considerable difference in the ease of digestion. A thoroughly baked, one-crust pie is to be preferred.

Cake in the form of plain or gingerbread cookies, sponge cake, and plain cake may be included, but rich cake has no place in the child's diet.

Sweets should be taken at the end of a meal, and not between meals. Fats, such as butter and thin cream, are very valuable, and it is advisable to serve them as simple fats rather than to use them in cooking—that is, use the butter on bread or vegetables, and the cream on cereals or desserts. Fried-out bacon fat, if not overheated, makes a good fat to spread on bread or to use with baked potato. However, while fats are important foods, foods fried in fat should be omitted from a child's diet.

Condiments, such as pepper, and stimulants as tea and coffee, are not needed and have no place in such a diet. The following is a suggestive food plan for a child from eight to twelve years of age, the daily fuel requirement being from 1,700 to 2,400 calories:

BREAKFAST—

Fruit, fresh, stewed or baked	50-100	Calories.
Porridge	100-150	"
Dry toast or stale bread	75-150	"
Butter or other fat	50-100	"
Milk to drink and on porridge	150-250	"
	450-750	"

DINNER—

Flesh food or substitute, as egg	50-100	"
Potatoes or substitute as rice, steamed bananas, etc.	75-100	"
Green vegetables	10- 50	"
Bread	75-200	"
Butter or other fat	50-150	"
Dessert	150-200	"
Milk to drink or as soup	100-200	"
	650-1,000	"

SUPPER—

Cereal, as rice, cream of wheat, etc., or cream soup, or other suitable dish	200-300	"
Bread	75-200	"
Butter or other fat	50-150	"
Dessert or stewed fruit, with or without cake	150-200	"
	500-850	"

The estimated fuel value gives one approximately the minimum and maximum portions to be served.

Similar food plans may be worked out for children of different ages, the portions served being calculated to accord with the following table of requirements:

Age.	Calories from protein required per pound of body weight.	Total calories required per pound of body weight.
5 years	3-4 Calories	35-37 Calories
6 "	4 "	34-36 "
7 "	4 "	32-35 "
8 and 9 "	4 "	30-35 "
10 and 11 "	4 "	28-32 "
12 and 13 "	3 "	25-30 "
14 - 17 "	3 "	20-25 "

Diseased Mouths a Cause of Ill-Health*

ARTHUR DAY, D.D.S., TORONTO.

THE importance of hygiene and personal cleanliness is becoming more and more generally recognized by all civilized nations.

This recognition must be on an ever-increasing scale if disease is to be stamped out, and the health of the public improved. The Provincial Board of Health looks after scientific sanitation, protecting the public from the injurious effects of impure water and impure food, sewage, and overcrowded living conditions, and isolating all persons afflicted with contagious diseases.

Of all hygiene, however, not the least important is the hygiene of the mouth.

Dr. Mayo, the celebrated United States surgeon, says that the next great forward movement to be undertaken in the prevention of disease is the procuring of clean mouths among the people. Now that we know so many diseases are communicable, it is a duty to society, for each one of us to have as healthy and germ-free a mouth as possible.

Probably the majority of the population forget that the mouth, which should be the cleanest part of the body, becomes the filthiest when neglected. There is nothing more disgusting than a mouth that is a stranger to the tooth-brush, or one that is treated only occasionally to a half-hearted scrubbing with this highly necessary toilet article. A person with such a mouth, when sneezing or coughing, forces into the air disease germs, which immediately become attached to dust particles, poisoning the air which others must breathe, with myriads of disease-producing germs—such as pulmonary tuberculosis, pneumonia, diphtheria, tonsilitis, la grippe, the common cold, and many others. Imagine also, if you will, a person with a dirty mouth swallowing this filth with every mouthful of food.

Medical authorities state that fully seventy-five per cent. of disease either originates in the mouth, or enters the system through it.

*Bulletin 242, Ontario Department of Agriculture, Women's Institute Branch. Written for the Oral Hygiene Committee of the Ontario Dental Society.

Unightly teeth and foul breath create anything but a favorable impression in business and social circles, counting much against success in every walk of life. But the value of sound teeth and a healthy mouth must not be judged solely by appearances. There is a more serious result arising from a disease-infected mouth, and that is *the effect upon the general health*.

Probably few people have any idea of the enormous number of germs (i.e., bacteria) to be found in the human mouth. Authorities differ as to the exact number, but a conservative estimate is, that the ordinary varieties which are to be found in a diseased mouth number about fifteen. However, bacteria multiply so rapidly that tens become millions in a few hours if the condition of the mouth is favorable to their reproduction.

A noted bacteriologist has estimated that in a certain very unclean mouth there were not less than one billion one hundred and forty million bacteria. Think of the atmosphere of a room inhabited by a person with such a mouth! Some of these germs are more poisonous or disease-producing than others, but it is a fact that the human mouth, when in a diseased condition, contains many of the most virulent germs known. This is particularly true of germs associated with decayed teeth having abscesses at their roots, and those associated with pus which may be pressed out from around the necks of the teeth. These conditions are exceedingly common, and it is an accepted fact that dental disorders are the most widespread that afflict the human race, and that many obscure ailments affecting the general system—such as chronic dyspepsia, gastritis, certain nervous affections, and general diseased conditions of the blood, as pernicious anæmia—may be traced to a diseased mouth. This kind of mouth is the result of failure to make proper use of the tooth-brush, and of failing to consult a dentist when decayed teeth, or red and swollen gums are first noticed.

It seems hard to impress the public with the seriousness of these facts. The subject is one of great importance from the standpoint of public health. It is second to none that concern the physical and mental welfare of the people, as it affects the entire community. These mouth troubles are alarmingly frequent in the children of the public schools, and in most localities no adequate measures have been adopted, up to the present, to cure the evil or to arrest its progress. Great efforts are being made to stamp out tuberculosis; much has been done to prevent cholera, diphtheria, rabies, yellow fever, typhoid, meningitis, and other preventable diseases; but how little has been done in most places to rescue the school children from the dangers of mouth bacteria. Statistics show that over ninety per cent. of the children in public schools have decayed teeth; or abscessed teeth, the pus from which is being constantly swallowed.

In this province, Toronto is one of the few places where the

mouths of the children, rich and poor, are systematically cared for. In other places the rich are privileged to have healthy mouths, and even in such cases neglect is frequently the rule.

Without a doubt, the spread of such infectious diseases as diphtheria, influenza, pneumonia, bronchitis and tuberculosis, in the public schools, is greatly increased by the unsanitary condition of the mouths of many of the children. The campaign against the spread of tuberculosis meets with many obstacles that are hard to overcome; but in a campaign against mouth infection all that is needed is regular inspection of the school children's mouths, instruction to the children in the proper preventive treatment, and a dental clinic maintained by the municipality, where the mouths of the children whose parents cannot afford to pay for the work, will be put in a condition of health.

As to the effects of an ill-kept mouth on the mouth itself: probably the most common is toothache. Toothache is too well known to require any discussion; the more serious conditions are those that follow the ache. Toothache is succeeded frequently by a swollen jaw, the swelling being caused by pus at the end of the root of the tooth. Generally the pus discharges into the mouth through a so-called gum-boil. Though there may be no discharge into the mouth, the pus is absorbed by the blood and carried to all parts of the body, and sets up many diseases, of which mention will be made later. Swollen glands in the necks are very often caused by pus which travels down to them from the abscessed tooth. The tubercular germ is more or less constant in the mouth, and often becomes mixed with this pus, and when it enters the glands of the neck it is apt to travel through the entire system, perhaps lodging in a joint, or in the lungs.

The tongue is sometimes the seat of ulcers due to the mechanical irritation of decayed teeth having sharp edges, and to masses of tartar. Ulcers of this kind, when neglected, are often the starting point of cancer. Cancer is much more prevalent than tuberculosis in those above forty years of age, so that it is important to attend to any ragged edges or points of irritation to the tongue.

On account of its close proximity, the throat may be infected from a diseased mouth. It is a fact that periodic attacks of tonsilitis are often a result of an unsanitary mouth. A number of diseases come from infected tonsils, and in many cases the tonsils are infected from the mouth. The spread of diphtheria is much more rapid, and its virulence greater among children with neglected and diseased mouths, than among those whose mouths are in a fairly hygienic condition.

The mouth is never entirely free from bacteria, because they are in the open air, in street cars, on the floors, and in every place. When a mouth is in a neglected and unsanitary condition, it is a veritable hotbed of infection, swarming with organisms which infect the tonsils, the ears, the throat, the bronchial tubes, the lungs, the stomach, and the intestines.

The long-continued ingestion of myriads of disease germs by swallowing them with the food, and during the intervals between meals, cannot but retard the process of digestion. Besides, the constant presence of those poisons in the stomach and intestines will sooner or later infect the lining of these organs, setting up an inflammation in the stomach and the intestines, increasing the danger of appendicitis. The gastric juice of the stomach is not a barrier to the passage of bacteria from the stomach to the intestine. Smithies, an English authority, in an examination of 2,406 people with stomach trouble (indigestion, etc.) found bacteria in 87 per cent.

The bronchial tubes and the lungs are subject to infection from an unsanitary mouth. Pneumonia very often follows the taking of an anæsthetic, due to the passage of bacteria from the mouth to the lungs during the heavy breathing while under the anæsthetic, and at a time when the patient's power of resistance to disease is lowered.

The diseases which may arise by indirect infection through the absorption of bacteria in the mouth into the blood are exceedingly numerous; in fact, this possibility covers almost all germ diseases, including those that are considered contagious and infectious and those that are not. Among the more serious of these might be mentioned inflammation of the inner part of the bone, heart disease, kidney disease, pus in any cavity of the body such as in the chest, meningitis, a slow and general poisoning of the blood, erysipelas, diabetes, etc.

Dr. R. Ackerly, of London, England, in a lecture before the Royal Society of Medicine upon "Observations of the Mouth in One Thousand Consecutive Cases of Chronic Diseases," said that he found that 36 per cent. had less than half their natural chewing powers owing to a loss of tooth tissue, and that 22 per cent. had mouths containing pus (which is necessarily disease-laden). He says, "If careful mastication is necessary for those whom we call healthy . . . surely it is more obviously necessary for those who are failing in health and whose nutrition is imperfect, especially in the large groups of chronic diseases in which are marked dyspeptic symptoms . . . diseases of the stomach, bowels and liver, and directly and indirectly most heart complaints, the condition described as gouty and rheumatic, and all those in which there is wasting, or a tendency to waste. Quite apart from the definite evils following the swallowing of lumps of food, or food imperfectly mixed with saliva, is it not obvious in these cases that, whatever else we do, it is only by attention to mastication that we can hope to improve impaired nutrition? It is quite common for patients to be supplied with a list of articles of food that they must or must not eat, but I find it necessary to tell them, 'It is far less important what you eat than how you eat it.'"

The following case is taken from the *Medical Record*, and is reported by Dr. Brandon:

"Mrs. S. J. W., age 34 years, had always enjoyed the best of health previous to her present trouble. Was suffering almost continually with neuralgia (facial), also dyspepsia, and, as she termed it, sick headache, nervous prostration, loss of sleep, irregularity of the bowels, etc., etc., so bad that she was compelled to keep her bed for days at a time. She had employed many physicians, with only temporary relief. Upon examination, could detect no constitutional disturbance that could be attributed as the cause of her trouble. But noticing her foul breath, requested to examine her teeth, which were found in a bad condition, several broken down, others with the gums falling away, and so on. Requested her to have the offending members removed. She objected, as it would hurt, and went to another physician for treatment, but finally returned, when, upon assuring her that it would be a great help, she consented to the operation. All the irritated and irritating teeth were extracted. When asked if I was not going to prescribe for her, informed her I was not. Three months later she informed me that she had enjoyed splendid health since the operation."

Wallis, of London, England, who was one of the original investigators of the conditions of school children's mouths, is of the opinion that diseased mouths in children have a most detrimental effect upon the health. *The British Journal of Dental Science* quoted him as follows:

"He had considerable opportunity in the last few years of watching the effects of oral sepsis in London County Council school children. In certain schools there were dental charts showing the weights and the average ages of the children, and these clearly showed that the children with the most septic (diseased) mouths were not only below the average weight of their class, but were below the average intellectual status of their age. Those with the most highly septic mouths were frequently two standards below what they ought to be in accordance with their age. With regard to oral (mouth) sepsis, it has been his plan at the hospital to have the patients weighed weekly after wholesale extractions of teeth, and, in spite of their being left unable to masticate their food, they progressively increased in weight, and at the end of a few months they had in nearly all cases gained several pounds. That seemed to show that the really serious matter was not so much the want of mastication as the fact that they were constantly swallowing the products of decomposition and the micro-organisms of disease."

Swallowing food before it is properly masticated is generally supposed to be a habit only, and, while it does become a habit, it is frequently necessitated by a tooth which has a large cavity, and which is tender, or an inflamed tooth which has a swelling at the root, and which also is tender. It is impossible to masticate the food properly if too many teeth have been extracted, or if the teeth are

decayed away, leaving only the roots. If the food is not masticated a sufficient length of time the proper amount of saliva is not mixed with it, which is necessary to digest certain elements in the food. When food, imperfectly masticated and improperly mixed with saliva, is swallowed, fermentation is soon established, with the formation of gases, which cause discomfort or pain. Proper mastication cannot be accomplished without good teeth. Normal digestion is impossible without proper mastication. Perfect assimilation is impossible without normal digestion, and without proper assimilation there cannot be sufficient nutrition. True, there are a great many who are strong and healthy, and who have few teeth or none at all, but these persons are exceptions. A popular slogan runs thus: "Chew your food, your stomach has no teeth."

Mr. Peter Danial, the well-known surgeon of London, England, in speaking of his experience with diabetic patients, says that, in his opinion, this disease occurs most frequently in people who neglect the care of the mouth.

It is also recognized that a great many nervous affections, some of which last for years, are due to unsanitary mouths. In patients about to undergo an operation, the part to be operated on is made thoroughly clean, and the surgeon has all his instruments disinfected, but if the patient's blood is infected from a diseased condition of the mouth, that infection being carried to all parts of the body, may, and very often does, infect the wound of the operation and cause blood-poisoning. Operations, especially upon the stomach or intestines, including the appendix, should not be undertaken until the mouth has been put in a thoroughly healthy condition, when there is time for it, otherwise the patient is apt to be infected by the swallowing of the disease germs which are in the mouth.

There is another condition of the mouth which is almost entirely unknown to the general public—a condition which, while not common, has far-reaching effects when it does present itself. It is a result of impacted teeth. An impacted tooth, instead of growing into the mouth in the regular way, is lodged entirely in the jaw-bone. It is often caused by the teeth growing sideways in the jaw instead of growing into the mouth. It does not appear through the gum at all. The tooth, by taking up a position and occupying space which was not intended by nature, causes a pressure on the nerves, resulting in a severe nervous irritation. The results of this irritation in various parts of the body are very many; there may be pain around the tooth or pain elsewhere, as in the eye, the ear, etc., or the trouble may manifest itself in the form of insomnia, melancholy, or insanity. Prof. H. N. Upson, in the investigations into the relationship of dental diseases to moral aberration, found that irritations of practically a painless character were frequently responsible for moral deficiencies, just as they were for mental deficiencies.

"In the course of an investigation into the subject of impacted teeth as a cause of insanity," says the Professor, "I examined eighteen of the younger inmates of the Cleveland Workhouse with a special view to the impaction of teeth. Of the eighteen cases, ranging from eighteen to twenty-five years of age, twelve showed multiple impactions (of teeth)."

He reports the following cases:

"A robust mechanic, age 28 years, three weeks before being seen had been moodily accosted by his wife, who said that she believed she was losing her mind. It immediately occurred to him that he might be losing *his* mind. He slept little that night or the succeeding nights, gave up his work, and spent his days in fear of the asylum. Tonics and assurances were of no avail. The only lesion that could be discovered was dental caries. The filling of a deep cavity extending into the pulp of the tooth was followed by prompt recovery, and he returned to work. At no time had there been toothache or other pain, but dizziness and sweating had been noted."

"An unmarried woman, aged 27 years, a teacher, for a year had been profoundly melancholy, with intractable insomnia, delusions of various deadly sins, and entire hopelessness of recovery. Restlessness was extreme; tonics and local uterine treatment were of no avail. As a last resource the teeth were examined. They were apparently in good condition. An X-Ray showed, however, an impacted right upper third molar tooth pressing against the second molar—a condition obviously capable of causing irritation. The tooth was removed, and in about a week the symptoms began to improve. Recovery was complete in six or eight weeks, and has persisted for six months."

He says, further: "The inference is warranted that the teeth in melancholics, neurasthenics, and those afflicted with insomnia should share the honors of a medical examination equally with the contents of the chest, abdomen and pelvis, and, when diseased, should be cured."

Another case, ". . . one of insomnia and mild melancholia in a merchant of 40 years of age. Trouble began four or five years ago in occasional attacks of sleeplessness and mental depression. Two years ago depression and insomnia became persistent and annoying. At times depression was followed by elation, also attended by insomnia. These conditions were improved by rest, and became worse by work and worry. Had no headache, no neuralgia and no toothache, except occasionally from an ulcerated tooth, which was relieved by evacuating the pus. Had parted with three molars during the last four years on account of abscess at the roots. An X-Ray showed left upper third molar was impacted against the roots of the second molar, high in the jawbone. The second molar was dead, but showed no evidences of abscess. Both teeth were extracted. The patient made a progressive recovery. Sleep was better two

nights after the operation. Depression has disappeared, and the patient has made a practical return to health."

A fourth case, ". . . . is one of severe delusional and suicidal melancholia in a teacher of 27 years old. When first seen she had been profoundly melancholy for more than a year. Had persistent insomnia and many delusions that her mind was gone, had never been quite sane, and that she had committed various dreadful sins. Treatment by tonics, by suggestion, change of scene, and other treatment were of no avail. After a year of useless effort the teeth were examined, and found in apparently normal condition. X-Ray showed an impacted upper third molar, which was removed. Patient had never in her life suffered from toothache or any other disease of the teeth or the jaws. She began to sleep well within a week or ten days after the extraction of the tooth. Her return to normal health was steady, and was typical in the fact that the delusions persisted longer than the melancholy. In such patients it is practically invariable that the emotional health is recovered first and the delusions are got rid of after. The only physical disease in this case was the impacted tooth, the other viscera throughout being healthy. The recovery has been complete."

The same results, only not to such a serious extent, may be caused by irregular or crooked teeth.

If unsanitary mouths are so common, and if they contain so many disease germs, it may seem strange that we are not infected with more diseases than we are. And so we should be but for the forces in our bodies which combat disease and render the germs harmless. These forces are spoken of as our powers of resistance, or our immunity from disease. A person may consume typhoid-infected milk or water for years, and finally, owing to a lowered resistance due to some cause, lose his immunity and fall a victim to typhoid. It is the same with many other diseases, the germs of which are found in the mouth. The person with a germ-laden mouth is taking the chance of getting almost any disease when his system is run down and his power of resistance is lowered. Also, he might carry the germs in his mouth, and, while not taking the disease himself, might transmit it to others through his breath or sputum. This was shown to be the case lately in this province when fifteen meningitis "carriers" were isolated from the rest of the soldiers at the Toronto camp during the outbreak of that disease there. Though some people might live a long time with the germs of a great many diseases constantly in the mouth, it would be extremely unwise for the rest of us to take such a chance. The germs of pneumonia are to be found in the mouths of one-third of us, but in order to contract pneumonia there must be a properly balanced relation between the virulence of the infection and our power of resistance.

With our present knowledge of the specific organisms of so many

diseases, is it too much to suppose that each disease may have specific bacteria as its cause (with the exception, of course, of inherited defects and injuries)? Whether they all have or not, we know of a great many that have, and almost all of these may enter the system through the mouth, especially if that organ is not kept in a hygienic condition. As to the number of mouths that are unhygienic, Dr. Gilmore, of Chicago, an authority on this subject, says that 25 per cent. of the population are suffering from pus at the roots of one or more teeth. This pus may find its way into the stomach or intestines by being swallowed, or may be absorbed into the blood and circulated to all parts of the body. The health of any person with an unclean mouth is *always* in danger. The time is sure to come, sooner or later, when, owing to a cold or other cause, the individual is "run down," and his power of resistance is lowered, and some serious illness is contracted, the infection of which came from the mouth.

To prevent as much as possible, therefore, the contracting of disease, two rules must be observed. First, keep the mouth as free from bacteria as possible. This condition can best be obtained by the proper and regular use of the tooth-brush, using it in such a manner as to brush every part of the mouth, the spaces between the teeth, and the top of the tongue. Second, keep at a distance from those suspected of having unclean mouths, especially if they are in the habit of coughing or clearing their throats. The power of resistance can best be maintained by proper mastication of the food with a good set of teeth, and by closely observing the proper laws of living.

Investigations as to Frequency of Metastatic Eye Infections from Primary Dental Foci

*Preliminary Report.**

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IT must be realized that ideal research conditions cannot be obtained in investigations such as we are reporting on, for the reason that the ailments for which the patients are presenting themselves are of such a nature that we did not feel justified in eliminating all routine treatment owing to the danger of possible irreparable damage due to delay, should the dental foci not be the etiologic factor.

In the course of the past year, fifty-seven patients with various eye conditions were sent to the dental department of the Herman Knapp

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Memorial Eye Hospital for dental treatment. The diagnosis in these cases and the results obtained were as shown in the accompanying table.

The general impression which has hitherto obtained is that these metastases occur through the blood stream, but our observations have led us to the conclusion that this belief is not substantiated by the clinical evidence. With one exception, all the patients cured or materially benefited presented dental infection on the same side as the affected eye. If the belief that these metastases occurred through the blood stream was correct, we feel we should have observed more cases in which cure or material improvement occurred, when the dental infection was on the opposite side from the affected eye. Failing to have seen such cases, we have been led to the conclusion that these eye metastases, occurring from primary dental foci, travel through lymphatic channels. We have recently endeavored to demonstrate the correctness or fallacy of this belief by means of animal experimentation, but unfortunately, the number of experiments carried out so far are too few to arrive at any conclusion. Animals injected intravenously or through lymphatic channels have all died without presenting any eye lesion whatsoever. We have been using rabbits for this work, but as they are particularly susceptible to

DIAGNOSIS AND RESULTS IN FIFTY-SEVEN CASES.

Diagnosis	Cases	Cured	Materially Improved	No. Result
Chronic iridocyclitis	9	2	1	6
Acute iritis	7	1	4	2
Detachment of retina	5	..	..	5
Episcleritis ..	2	..	1	1
Choroiditis ..	10	1	2	7
Iridochoroiditis ..	2	..	..	2
Acute iridocyclitis	5	..	5	..
Vesicular keratitis	1	1	..	..
Keratoiritis ..	2	..	1	1
Postoperative iritis	3	1	1	1
Cyclitis ..	1	..	1	..
Corneal ulcer	2	..	1	1
Retrobulbar neuritis	1	..	1	..
Retinal hemorrhage	1	..	..	1
Chorioretinitis ..	1	..	1	..
Interstitial keratitis (nonspecific)	1	..	1	..
Neuroparalytic keratitis	1	..	..	1
Dendritic keratitis	2	1	1	..
Sclerosing keratitis	1	1	..	..
	57	8*	21†	28‡

* 14 per cent.; † 36.85 per cent.; ‡ 49 per cent.

streptococcus infections and succumb very readily thereto, we feel we shall have to secure animals less susceptible in order to carry on further investigation.

Believing it may be of interest, we will briefly outline a few typical cases:

CASE 1.—C. B., man, aged 34 years, Dispensary No. 15267, presented himself Feb. 2, 1916, with the history of blurred vision of the left eye for the past four days. He had had a similar condition a

year previously, and was treated at that time for choroiditis and glaucoma. On examination, vision in right eye was 20-20, left, 20-30. Vitreous opacities and choroidal patch in lower temporal region of the left eye. Diagnosis, choroiditis. Urinalysis was negative, as was also the streptococcus complement fixation. An examination of the nose and sinuses excluded them as possible etiologic factors. Feb. 14, 1916, the upper right cuspid and second bicuspid were roentgenographed, disclosing an apical infection about the root of the cuspid. This tooth was extracted and a culture made from the root end and the currettings from the socket. Culture gave *Streptococcus viridans* as the predominating organism. Feb. 19, 1916, five days after the extraction of the cuspid, vision was 20-20 and the eye was much clearer. It cleared up entirely in a short time and has remained so since.

CASE 2.—J. K., male, aged 24, Dispensary No. 23416, presented himself March 2, 1916, with a history of pain and inflammation in the left eye for one week. The patient gives the history of having had syphilis and gonorrhea recently. Has had considerable disturbance from one of the teeth in the upper maxilla. Examination: Vision R. 20-20, L. 20-30; conjunctival and ciliary congestion. The left pupil reacts sluggishly and the iris is greenish in color. Internally, the eye shows congestion of the retinal veins. The Wassermann and gonococcus complement fixation were negative; the streptococcus complement fixation, weakly positive. On March 7, 1917, a roentgenogram of the upper left maxilla showed an apical infection about the roots of the upper left first molar. On the following day this tooth was extracted and a culture made. The culture showed a pure growth of staphylococci from which the vaccine was obtained. The extraction of this tooth was followed by a slight reaction, the eye becoming somewhat redder. On March 14, 1917, the eye was almost white. On the 21st, the fundus examination showed a diminution of the venous congestion. He received two doses of the autogenous vaccine before he left our care, March 26, at which time the eye was white and only slight venous engorgement remained.

CASE 3.—W. R., man, aged 51, Dispensary No. 21026, presented himself Oct. 27, 1916, with a history of redness of the upper lid of the left eye of one week's duration. Examination showed vesicles of forehead and upper lid. The eye was normal. The patient was given aluminum acetate to apply locally in the form of a wet dressing. On November 20, he again presented himself with a history of failing vision of the left eye for two weeks previously. Vision L. 20-40; the cornea shows an opacity nasally and below and is anesthetic. B. P. 160. The Wassermann reaction was negative, the streptococcus fixation weakly positive. Examination of the teeth revealed a severe pyorrheal condition of the six lower incisors, the

only teeth remaining. The extraction of these teeth was advised, but this the patient refused to have done. On November 24, his vision had fallen to 20-100. On December 4, all the teeth were extracted; at this time the vision was 20-200, and the cornea was hypesthetic. From now on, his condition gradually improved until on December 27 the cornea was no longer anesthetic and the eye was almost white. On January 12, the eye was white, the vision was 20-40, and showed only a faint macula as the remnant of the inflammation.

CASE 4.—M. S., woman, aged 27, Dispensary No. 15743, previously presented herself Feb. 26, 1916, with a history of having had the grip two months prior to coming to the dispensary, following which the left eye became painful. She is married, has three children, has never aborted and is otherwise normal. Examination: Vision R. 20-20, L. 20-70. The right eye shows four nodules of episcleral and possibly scleral infiltration. They are situated above and temporally, over which areas there is slight congestion. In addition to these nodules there is a vertical band of superficial opacity about $2\frac{1}{2}$ -3 mm. wide, extending from the pupillary margin temporally almost to the centre of the cornea, with a smaller band temporally. A roentgenographic examination of her teeth showed apical infection about the roots of the upper centrals and about the root of the lower right second bicuspid. The roots of the upper centrals were filled and the ends amputated and the lower right second bicuspid was extracted. Cultures were made in both instances. The culture from the root ends of the centrals showed the staphylococcus to be the predominating organism. *Streptococcus viridans* and the pneumococcus were present. The culture from the bicuspid socket gave *Streptococcus viridans* as the predominating organism. From this culture a vaccine was prepared. Patient received in all fifteen injections of the autogenous vaccine at intervals of seven to ten days. Following some of the injections there was a slight reaction in the form of backache, headache and an increase in the local redness. When this occurred the dose was diminished. In June, four months after her first visit to the clinic, her vision had increased to 20-20 and the nodules were very much smaller. The nodules subsequently disappeared and the opacity became fainter.

CASE 5.—F. A., woman, aged 44, Hospital No. 19183, presented herself September, 1915, with a deep keratitis of the right eye for which the etiology could not be found. She gave a positive reaction with tuberculin, but treatment with tuberculin did not improve her condition. Thyroid tablets were also given without result. She was treated in this manner until Dec. 12, 1915, when a roentgenographic examination of her teeth showed an apical infection about the roots of the lower first molars, the upper left first and second bicuspid and the upper right cuspid and the second bicuspid. On the following

day the lower left first molar was extracted and on the fifth day following, the root of the upper right cuspid was filled and the end amputated. A vaccine was prepared from a culture taken at the time of the root amputation. She was given this autogenous vaccine and her condition gradually improved. Two weeks following the root amputation, the eye was clear and the pain had completely subsided. When last seen in October, 1916, her vision was normal and there were only a few deposits remaining marking the site of the old infiltration.

CASE 6.—W. J., man, aged 71, Hospital No. 19898, was operated on for a mature cataract of the left eye June 20, 1916. The second week the eye became inflamed. Patient had recurring attacks of iridocyclitis, sometimes with the development of hypopyon. The Wassermann and the streptococcus complement fixation were negative. On July 6, 1917, the upper left bicuspid (first) and upper left first molar were removed. This was followed by considerable local improvement. The patient subsequently had two more attacks of iridocyclitis. On August 21, a roentgenographic examination showed abscesses about the upper left second bicuspid, lower left first molar, upper right and second bicuspids and upper right lateral. Later the lower left first molar was removed and a culture made from the socket gave a pure growth of *Streptococcus viridans*. Following the clearing up of these dental foci, the eye improved and no further iritis occurred.

CASE 7.—J. S., man, aged 42, Hospital No. 20251, presented himself Nov. 3, 1916, with the history of having taken "cold" two to three weeks previously, following which the right eye became red and discharged pus. He continued at his work and did not consult a physician until the day before admission to the hospital. An examination of the secretion from the conjunctival sac was negative. A grayish infiltrate, irregular in outline, ran across the lower half of the cornea, somewhat dendritic in shape. The cornea was hypesthetic. The streptococcus complement fixation was negative. On Nov. 13, 1916, roentgenographic examination showed abscesses about the roots of the right central, lateral, cuspid, first bicuspid, first and third molars, also the upper left central. All these teeth were removed. Following the extraction, the patient made a rapid improvement and was discharged cured.

CASE 8.—F. O'R., man, aged 22, Dispensary No. 22729, presented himself Jan. 29, 1917, with the history of an acute inflammation of the left eye of three days' duration. The history was negative, with the exception that the patient had a severe cold just before applying for treatment. The patient admits having poor teeth. Examination gave vision R. 20-100, L. 1-200. Pupil narrow, anterior chamber filled with exudate. Urinalysis negative; Wassermann and

gonococcus complement fixation negative; streptococcus complement fixation +. Patient did not improve under the usual treatment for acute iritis. A roentgenographic examination of his teeth revealed abscesses of upper left first bicuspid, first molar, lower left third molar, upper right first bicuspid and first molar. These teeth were extracted and there was an immediate improvement in the condition of the eye, the vitreous, however, still remaining hazy. At the time of discharge the patient's vision had increased to L. 20-100 and the vitreous had cleared up considerably.

CASE 9.—W. O'C., woman, aged 27, Dispensary No. 22024, presented her self Dec. 21, 1916, with the history of having had an attack similar to the present one, in both eyes, at the age of 13. For the last five months the left eye has been bothering her. She complains of poor vision, redness and photophobia. The family and the personal history are negative. Examination: Vision R. 20-40, L. 20-100. The left eye shows numerous opacities, eight or nine in all, of irregular size and shape in the substance of the cornea. Some of the patches are white, others grayish. The Wassermann reaction, urinalysis and examination of the nose proved to be negative. Patient was given 1mg. of tuberculin T.O. but did not react. A roentgenographic examination of her teeth showed abscesses over the upper left lateral and first bicuspid, also about the lower left first molar, right first bicuspid and upper right third molar. On December 23 the roots of the lower left first molar were extracted and on the 26th the upper left lateral and first bicuspid, upper right second bicuspid and third molar were extracted. Patient's condition did not improve until some time later. Six weeks after extraction of the teeth the vision of the left eye was 20-40 plus, and the cornea was decidedly clearer.

CASE 10.—M. J., woman, aged 30, Dispensary No. 19480, presented herself Aug. 12, 1916, with the history of having had pain in the right eye for two weeks. Patient says she had a previous similar attack in 1903, at which time she was treated for eleven weeks. The Wassermann reaction was + + + +. Later the left eye became involved, and she was admitted to the hospital on Nov. 10, 1916. She did not improve under the routine treatment for cases of specific iridocyclitis, which treatment included mercurial inunctions and injections. On November 19, a roentgenographic examination of the teeth showed apical infections about the roots of the upper right lateral, second bicuspid, lower right third molar, upper left central, lateral first bicuspid, upper and lower left third molars. All these teeth were extracted, giving almost immediate relief from pain. The patient from then on made a rapid and uneventful recovery.

It will be noted that a fraction over 50 per cent. of the cases were either cured or benefited by dental treatment. It is not meant that the

conclusion should be drawn that 50 per cent. of infectious eye conditions will be benefited or cured by dental treatment, but that when dental infection is present, coincidentally with an infectious eye condition, there is a strong probability that the dental foci may be a material etiologic factor.

We would again call attention to the fact that in all but one of the cases enumerated, dental infection has been on the same side with the affected eye.

Owing to the fact that the usual dental examination is of a very perfunctory nature, it is perhaps not out of place for us to warn the ophthalmologist to satisfy himself that a careful roentgenographic examination has been made of all suspected teeth before excluding them as a possible etiologic factor in infectious eye conditions.

28 West Eighty-Ninth Street, New York—94 Lenox Road, Brooklyn—155 East Sixty-Second Street, New York.

ABSTRACT OF DISCUSSION.

DR. MEYER L. RHEIN, NEW YORK: I do not agree with Dr. Levy in regard to the deduction he makes from the complement fixation test. He says he places very little reliance on a small positive result. This is not at all in conformity with my own clinical experience with this test.

As mentioned elsewhere, up to date there have been over 150 strains isolated, and we do not know at present how much further these strains may go. Consequently a negative streptococcus fixation test does not necessarily prove that there is not a streptococcus infection by a strain that has not been used for comparison. I have been using the test extensively for a year and a half, and my own clinical deductions are that even a small positive test is of great diagnostic value. There is a great deal of uncertainty about it, but I do not think that it is fair to the test to draw the conclusions the essayist draws in his remarks. The one case he cites in which there was a negative test and in which staphylococci instead of streptococci were found, calls to our attention how frequently we may have this source of infection instead of the streptococcus, and of course if there is any great proportion of this form of infection, it presents an entirely different point of view relative to the complement fixation test and everything pertaining to it.

There is a strong possibility that both of these micro-organisms may be found; that is, in certain cases either one may be the attacking organism. I think this is a valuable form that investigations should take, and while it is of value, I feel that the investigator attached too much importance to the negative result of the fixation test.

DR. MORRIS I. SCHAMBERG, NEW YORK: I am not connected with any eye institution and have not observed as many cases as Dr. Levy.

I have had probably five cases in the last two years, among which a most refractory recurrent iritis on the right side was directly attributable clinically to an infection on an upper left molar tooth, which might have escaped attention even with the help of the Roentgen Ray if I had not used common sense in conjunction with it. There was nothing to suggest rarefaction at the apex, or any evidence of infection. A shadow in the picture showed a large filling which appeared to project into the pulp chamber, and I assumed it was pulpless. After applying the thermal test I decided to remove the tooth to make a culture from it. After the removal of the tooth the eye cleared up, though it did not occur for some time.

Eye cases respond almost as rapidly without vaccine treatment as with it. In one recurring case vaccines were administered with very gratifying results. Another case of iritis in a woman aged 86 defied treatment by the ophthalmologists and did not respond in any sense until I looked into the mouth. Nothing in the roentgenogram indicated infection or deep seated pyorrhea. I noticed, however, that there was an offensive breath, and that the fold at the gingival border was rather deep. I used tincture of iodine and alcohol in equal parts, having the part sprayed three times a day, and had a nurse make applications to the eye, spraying forcibly into the pockets a bland antiseptic, every half hour, and with that treatment the eye improved, though it had not responded until the mouth treatment was instituted.

I would sound a note of caution against the conclusion that the lymph channels are the means of transmission of infection to the eye. I believe the complement fixation tests and the blood cultures are just as uncertain as our findings in Wassermann examinations; in fact, I think more so. I feel that there is a great deal to be learned about these various tests, and I know that it is almost impossible, even though there are organisms circulating in the blood, for the average pathologist to recover them and grow them.

The same thing applies in connection with the test Dr. Levy proposed, the injection into the lymphatics. I am convinced that if autogenous vaccines are used in the blood stream, these antibodies formed will eventually reach the lymph channels, and if injected into the lymph channels they will reach the blood stream. I offer that as a suggestion.

DR. THOMAS L. GILMER, CHICAGO: I should like to ask a question. As a preface to this question I would say that those of us who have made a study of the bacteriology of alveolar abscesses and made animal inoculations, have used the vein of the ear to introduce the organisms. As a result, we have found ulcers in some organs and hemorrhages in many parts. In our work at St. Luke's Hospital we found as a result of such inoculations 20 per cent. of hemorrhages in

the periosteum of the jaw, and about the same in the joints. Does this not seem to indicate that the organisms go directly through the blood stream?

DR. JAMES H. KELSEY, ERIE, PA.: I should like to make just a few remarks in corroboration of Dr. Levy's paper, and to mention one or two personal experiences that I have had in connection with teeth and eye conditions. Dr. David N. Dennis, a well-known oculist in Erie, and I have cooperated to some extent in the last year and a half, and I have been able to compile records on some fifteen to twenty cases of eye conditions that have been benefited by dental treatment. I have in mind a few patients who have definitely assured me of the connection between eye conditions and teeth conditions; in one case particularly, that of a young man about 18 years of age, who had a neuroretinitis, a rather bad case, a Wassermann test was found negative, the spinal fluid was taken, nose examined, the Roentgen Ray showed the sinuses normal, and so on; everything possible had been done until he was referred for dental examination and diagnosis. We found an upper right first bicuspid showing a small granuloma. To hasten results, on account of the severity of the eye condition, this tooth was extracted. The eye cleared within a few days. The rest of his teeth were examined, and found apparently in good condition, but about three months afterward there was a recurrence of his eye trouble. Another thorough examination of his teeth disclosed a hidden cavity in the bicuspid on the opposite side from the one mentioned. The pulp was partially dead, and answered tests for both a vital and nonvital condition. I extracted that tooth and the eye condition cleared up again within two or three days. Since then, as I understand, there has been no recurrence.

In my experience eye conditions have had more to do, perhaps, with the ten upper anterior teeth than with any of the other teeth in the mouth. Another case was of a right central incisor with an apical infection that held a gold crown. The crown was removed and the tooth drained; within a few days, the eye condition cleared. I left the tooth open, and later closed it up, thinking perhaps it was all right. I sealed it hermetically with cement, and within a day or two the same eye condition presented itself again. I removed that filling, drained it again and treated the tooth further, and in the last eighteen months there has been no recurrence.

In one case of eye trouble we found a pyorrhea pocket around an upper third molar and nothing else wrong. We made a vaccine from this pocket, extracted the tooth, curetted the socket and used this vaccine for some time, and with local eye treatment the condition cleared, but prior to that for some months the patient had considerable trouble, everything else possible having been done.

DR. G. V. I. BROWN, MILWAUKEE, WIS.: In this discussion it

seems to me we are assuming that because there is iritis and an abscessed tooth, that, *ipso facto*, the eye trouble must be the result of the infection. That does not follow at all. It may still come from the tooth, but it seems to me that the newer study of nerve conditions in that region supplies a very much more simple reason why my friend got a more direct result in the relief of his case than he could have expected from an infection, because he had a direct nerve relief. Later investigations show that there is a much more direct connection than has been thought between the ciliary ganglion and the fifth nerve, so that the tooth which was extracted might easily have supplied the cause and the correction; whereas no amount of investigation and no test, complement fixation or anything else, could have demonstrated that the iritis was the result of infection. I am not saying it was not, of course, but I do not think in this discussion we ought to ignore this newer study of nerve conditions and look fixedly on the side of infection all the time.

DR. JOSEPH M. LEVY, NEW YORK: I believe the last speaker might be justified if we were only discussing iritis, but I wish him to recall that we have other cases and other eye conditions which have responded to dental treatment. One thing I will say in substantiation of the statement made by the last speaker. No one, I believe, among all those investigating these metastatic eye infections has ever been able to produce a bacteriologic culture from tissue taken from one of these eyes, and only once has anybody ever claimed to have produced an experimental iritis by animal inoculation.

Whenever I have drawn the conclusion that the eye condition may have been due to a primary dental infection and that there had been an infectious process in the eye, it was because I have the authority of Dr. Knapp and his staff at the hospital that such was the case. I am not drawing conclusions as to whether an eye condition is or is not due to either nerve irritation or infection, because I believe it is just as foolish for me to make a diagnosis about the eyes as for the ophthalmologist to make a diagnosis about the teeth. If the ophthalmologist turns a case over to me as an infectious eye condition, I have to accept his diagnosis. Whether or not this answers Dr. Brown I do not know.

In reply to Dr. Rhein's statement about the species of streptococci, I want to say that some of these streptococcus complement fixations were performed, using as antigens streptococci obtained from cultures made from the teeth and sockets at the time of extraction. We cannot, presumably, get closer to the original organism we want for an antigen than using the one from the culture made at the time of extraction. Of course the conditions under which the cultures are produced are entirely different from those in the

body, and there may be some difference in the organism itself when grown in culture than when grown in the body. If we take a culture from a tooth which we believe is producing an infectious condition elsewhere in the body and use it as an antigen for complement fixation, and the fixation result is negative, and we get a positive cure or material improvement from the elimination of this tooth, I think we are justified in concluding that the primary focus was where we believed, and the complement fixation showed there was no demonstrable toxin in the blood due to this organism.

Now as to Dr. Schamberg's statement about a recurring case of iritis in which he used a vaccine. If he made a careful roentgenographic examination and eliminated the dental focus, where did he get his vaccine for this case? Did he use a stock vaccine?

DR. MORRIS I. SCHAMBERG, NEW YORK: I refer to the fact that a roentgenographic examination proved negative until I used common sense in conjunction with it and decided to remove a pulpless tooth from which we took a culture.

DR. JOSEPH M. LEVY, NEW YORK: As to animal inoculations, most of the men doing animal experimentation seldom use less than 3 to 5 c.c. of a twenty-four hour culture. Their bacteria will probably run up to 100 million to the cubic centimeter. Rosenow uses colossal quantities, 15 to 30 c.c. We do not get anything like this in the human being. What we get, or what we have been led to believe we get, is a slow, gradual but constant inoculation with the active virus from the original focus. What we are trying to produce in our animals is a similar condition. If we give massive inoculations our rabbits promptly go to postmortem. We are trying to produce these slow but constant injections, simulating the conditions we find in the human subject, and see what results will be obtained. We have had the usual results obtained by other experimentors as to cardiac, arthritic and other involvements, but to date we have been unable to produce an experimental infectious eye condition.

National Dental Association

THE twenty-first annual session of the National Dental Association will be held in New York City, October 22nd to 26th, 1917. The N.D.A. is "of age" this year, and a special effort is being made to make the meeting in every way worthy of the occasion. The following partial programme has been announced by the Publicity Committee:

SECTION I.

"Some Neglected Operative Pre-requisites," by Dr. Fred E. Hart, of San Francisco.

"Porcelain Inlays" (except title not yet chosen), by Dr. W. L. Fickes, Pittsburgh, Pa.

"Interpretation of Radiographs," by Dr. Howard R. Raper, of Indianapolis, Int.

"Present Tendencies in Operative Dentistry," by Dr. J. M. Walls, of St. Paul, Minn.

Also an important paper dealing with the subject of dental education. Essayist not selected as yet.

SECTION II.

Dr. Virgil Loeb, of this Committee, reports that he has thus far accepted two essayists: Dr. Elmer S. Best, of Minneapolis, on some phase of root canal filling; and Dr. Howard R. Raper, of Indianapolis, on "Misinterpretation of Radiographs."

SECTION III.

"Ionization, With Special Reference to Ionic Chemistry," by Dr. Geo. T. Fette, Cincinnati, Ohio.

"The Chemical Action of Soil Bacteria on Calcium Phosphates, With the Chemical Analysis of the Human Teeth," by Dr. J. E. Hinkins, of Chicago, Ill.

"Why Measurements of the Mandible, Tracings of the Condyles, the Construction of Hypothetical Triangles, and the Use of the Face-Bow, are all Non-Essential in the Construction of Dentures Possessing the Highest Degree of Efficiency," by Dr. D. D. Campbell, of Kansas City, Mo.

Paper, subject to be announced later, by Dr. Calvin S. Case, of Chicago, Ill.

Also two other papers, titles of which will be reported later.

STATE SOCIETY OFFICER'S SECTION.

First Session. "Some Phases of Post-Graduate Work," by Dr. B. L. Shobe, Tulsa, Okla.

"Securing Some Satisfactory Legislation," by Dr. Alexander H. Reynolds, Philadelphia, Pa.

The Second Session will be devoted to six or seven short papers of five to ten minutes each by men of different State Societies, telling of some outstanding feature of their State Society's work that is thought to be of the greatest importance, or, if the essayist prefers, he may present the weak part of the work and ask for suggestions to help them out. These papers are to be followed by a general discussion, which we hope will bring out some very valuable points. The names of the essayists for this session have not as yet been secured.

COMMITTEE ON ANESTHETICS.

"The Teaching of Conductive Anesthesia," by Dr. Theodore Blum, of New York City.

"After-Pain in Local and General Anesthesia," by Dr. A. E. Hertzler, of Kansas City, Mo.

"The Toxicity of Local Anesthetics," by Dr. Geo. B. Roth, of Washington, D.C.

COMMITTEE ON ENTERTAINMENT.

At a recent meeting of this Committee, a Ladies' Auxiliary was organized, of which Mrs. Dr. M. L. Rhein was made the chief officer, and Mrs. Dr. Henry W. Gillett, 140 West 57th Street, New York City, Secretary. It would greatly facilitate the endeavors of the Ladies' Auxiliary to add as much as possible to the pleasures and comforts of the visiting ladies, if those who intend to come to New York would notify Mrs. Gillett, stating, if possible, the hotel at which they will be registered.

R. OTTOLENGUI, Chairman Publicity Committee.

British Columbia News

THE third annual meeting of the British Columbia Dental Society was held on the 18th and 19th of June, at the Vancouver Hotel, Vancouver City. The B.C. Convention was certainly a great success, and being followed on the 22nd and 23rd by the Washington State meeting, it was made possible for both these societies to enjoy as essayists, Dr. J. M. Jones of Vancouver, Drs. C. J. Grove and F. H. Orton of Minnesota, and Drs. E. S. Barnes and O. T. Dean of Seattle. A number of Washington dentists were present at the B. C. meeting and the Canadians reciprocated by visiting "our allies" during the Washington State Convention at the City of Tacoma. Among the B. C. men who attended the latter convention were: Drs. Peden and Sipes, who assisted with the clinics, and Dr. J. M. Jones, who gave a paper and Lantern Lecture on Root Canal Work. At the banquet held in the evening at the Hotel Tacoma, Major H. T. Minogue gave an address upon the subject of The Canadian Army Dental Corps. The presence of a Canadian officer in army uniform was the occasion of a spontaneous outburst of enthusiasm, the dentists jumping to their feet, waving napkins and cheering. The Tacoma Ledger reported the speaker as follows:

"About 25 per cent. of the men who volunteered for overseas service when the war first broke out were rejected for not being able to pass the rigid physical examination, which called for 22 sound teeth," said Maj. Minogue. "Several British Columbia dentists got together and volunteered their services in putting the men's teeth in good condition. Thirty Vancouver dentists volunteered their services, and when the army heads saw the value of their work, the

dental corps was organized. The medical corps has opposed the dental corps, but Minister of Militia Gen. Sam Hughes was very favorable to the dentists and they are still a recognized unit.

PERCENTAGE REJECTED REDUCED.

"About 85 per cent. of the men who enlisted needed dental treatment. Many had never been in a dental office before and much more work was required. As a result of the work of the dentists in keeping the men's teeth in good condition, the requirement in the physical examination of 22 sound teeth has been waived entirely. No man is allowed to go to the front until his teeth are in good condition. At first there was one dentist to each 1,000 men, but this number has been reduced to 750, and in each military hospital there is a dentist for each 200 beds. In the field dentists bear the rank of captain and rank on up to colonel.

"They have to take a nine weeks' officers' course in the infantry or cavalry so they can conduct themselves like soldiers as well as wear the uniform and look like soldiers."

Among those who attended the British Columbia meeting were the following:—

Vancouver members present during the convention numbered 32: Drs. Ida O. Montgomery, Major Minogue, W. Spencer, E. King, R. L. Coldwell, W. S. Watson, P. E. Margeson, C. H. Gatewood, R. S. Hanna, W. S. Richardson, F. Pollock, T. R. Peden, F. Wright, H. Wood, F. H. O'Neil, W. J. Lea, R. S. Goodwin, A. Brighthouse, J. E. Black, T. W. Snipes, J. M. Jones, G. Telford, Capt. Bagnall, Lieut. Bazeau, C. B. Mansell, W. J. Wrigglesworth, F. M. Nicholson, H. E. Thomas, R. L. Pallen, L. E. Gilroy, W. M. Gallagher and W. J. Curry.

New Westminster members numbered five: Drs. F. P. Smith, C. J. Smith, E. C. Jones, P. D. MacSween and H. C. Banford.

Seven members were present from Victoria: Drs. W. F. Fraser, Lewis Hall, S. M. Hartman, E. H. Griffiths, R. McKeon, Capt. Verrinder and A. A. Humber.

The other members present were: Drs. W. J. Davies and W. J. Hacking of Chilliwack, Capt. Shepherd of Kelowna, F. Morrison of Powell River, J. B. Gerry of Kamloops, J. C. Macdonald of Sardis, C. S. Dart of Salmon Arm, C. B. Turner of Penticton, and W. H. Gunning of Rossland.

Officers for the ensuing year were elected as follows:

President—Dr. Emery Jones, New Westminster.

1st Vice-President—Dr. Lewis Hall, Victoria.

2nd Vice-President—Dr. R. L. Coldwell, Vancouver.

Secretary—Dr. T. W. Snipes, Vancouver.

Treasurer—Dr. Geo. Telford, Vancouver.

Dr. R. B. Dier has taken over the practice of the late Dr. E. F. McGregor, of Nanaimo.

Fifteen candidates tried the June examination of the B. C. Board of Examiners.

Certificates in Equitation have been granted to Major H. T. Minogue and Captains R. F. Verrinder and W. Mason of the C.A.D.C.

Out of 87 candidates who took the Washington State Board examination in June, only 17 passed.

Following a recent military order, arrangements have been made for each officer and sergeant of the C.A.D.C. in M. D. 11 to take a qualifying course in Infantry.

The Ontario Oral Hygiene Committee of the Ontario Dental Society

Executive Meeting

THE Executive Committee of the Oral Hygiene Committee held its 60th meeting at the Crescent Inn, 473 Spadina Ave., on Tuesday, June 26th, at 6.15 o'clock p.m.

Members present were: Doctors Reade, Eaton, McLaughlin, Bothwell, Trotter, Husband, and Coyne.

Minutes of the last meeting were read and confirmed.

Moved by Drs. McLaughlin and Trotter that Dr. Reade be appointed Chairman for the ensuing year. Carried.

Moved by Drs. Bothwell and McLaughlin that all of last year's officers be reappointed. Carried.

Moved by Drs. Bothwell and Husband that the Secretary write Dr. Oliver Martin, of Ottawa, and Dr. Ross Thomas, of London, thanking them for their practical sympathy in the work of the Committee in sending their cheque to assist in the work.

Secretary read report from Dr. Conboy regarding establishing Rural Dental Inspection throughout Ontario, advising the appointing of a subcommittee to work out a plan which might adequately meet the needs of the work in the Province. Said plan to be submitted to the Ontario Government.

Moved by Drs. Bothwell and McLaughlin that Drs. Conboy, Secombe, and Ellis be appointed a committee to work out such a plan, and submit same to the Oral Hygiene Committee at its meeting in September.

Considerable time was spent in discussing the advisability and possibility of reaching the Teacher's Conventions, and providing speakers for as many conventions as possible.

Moved by Drs. McLaughlin and Bothwell that the Chairman, Secretary, and Vice-Chairman be a committee to get information regarding the number and place of meeting of the various Teacher's Conventions, and arrange for as many lectures as possible. Carried.

Considerable time was spent regarding the possibility of getting a skeleton form of lectures treating the work of Oral Hygiene from the various standpoints.

Secretary was instructed to furnish Dr. Eaton with information regarding the requirements along the different lines in order to more effectually carry on the year's work.

Moved by Drs. McLaughlin and Husband that the Secretary write the Chairman of the Toronto Dental Society, requesting him to appoint an Oral Hygiene Committee, with a good live chairman, to go into this work during the coming winter.

Meeting adjourned at 8.30 p.m.

N. S. COYNE,

Secretary Oral Hygiene Com.

Advisory Committee in Cases of Alleged Malpractice, Ontario Dental Society

THE Ontario Dental Society at its recent meeting named a special committee composed of F. J. Conboy, A. E. Webster, Wallace Secombe, A. D. A. Mason and R. G. McLaughlin, to be known as an advisory committee in cases of alleged malpractice.

This committee has been appointed specially to protect (by way of advice only) any member of the profession in Ontario who may be threatened with action for damages for alleged malpractice. Any member who may wish advice or suggestions in any such cases is invited to write the chairman, R. G. McLaughlin, 54 College Street, Toronto. The committee will carefully consider the facts and advise the member accordingly. All such communications will be considered strictly confidential.

Also the committee is arranging for the services of a legal counsel who has made a special study of dental malpractice. The services of this counsel will be at the disposal of any member of the profession who may wish to retain him, either to give a legal opinion on the case, or to defend the action before the courts.

It is strictly to be understood, however, that this committee is not undertaking to defend members in cases of alleged malpractice, nor to be liable for counsel's fees, but merely to give its advice if so requested.

THE COMPENDIUM

This Department is Edited by
THOMAS COWLING, D.D.S., Toronto

A SYNOPSIS OF CURRENT LITERATURE RELATING
TO THE SCIENCE AND PRACTICE OF DENTISTRY

BRUXO-MANIA—GRINDING THE TEETH, ITS CAUSE AND PREVENTION.

The above subject is an unusual one, and yet one wonders why its discussion is not entered into more frequently, because we all have sought to find an explanation of and a solution for this condition so apparent in many of our patients. Charles F. Bodecker, D.D.S., comes to our rescue in a publication in *Dental Register* of February issue.

The author, writing in *Archiv fur Zahnheilkunde*, a translation of which is given in the *Dental Register* by R. A. MacDonald, D.D.S., reports that "grinding the teeth is a nervous manifestation that has appeared in an unusual number of cases during the present war time, with the consequent exaggerated nervous strain and excitement. We have been forced to examine our patients with more than usual care, as they are wholly unconscious of this affection. We find in critical cases that the lower incisors and upper bicuspid are most abraded. The prominent cusps seem to afford a special incentive for the development of the habit. However, the cusps do not show the abrasion to the same extent at first as some of the teeth less protected by heavy enamel. Most patients deny grinding the teeth at any time, but evidently they do it unconsciously during the day or at night. There seems to be no other explanation in view of the almost universal testimony of patients, who are so affected that they are not at all conscious of such a habit."

The author suggests the classification of the causes of the abrasion of the teeth into two general groups of causes.

The first class being due to unusual nervousness: (a) a permanent nervous temperament; (b) a temporary nervous irritability.

The second class may be attributed to habit: (a) such as biting the lips, finger-nails, etc.; (b) concentrated thinking or working.

"In the first group, nervousness due to temporary irritability is probably the greatest cause of the present epidemic of tooth abrasion. I have noticed the condition most frequently among the volunteer corps of nurses and hospital attendants. Many such people are unaccus-

tomed to the sights of bad wounds and severe suffering, and naturally they occlude the teeth with unusual force to assist in maintenance of normal equilibrium and to enable them to go through their ordeal of 'duty.' "

Dr. Bodecker points out that this grinding is a useful function, as it occurs when there is no food in the mouth to masticate. Rarely do we find young patients whose teeth have been badly worn through eating. The molar teeth are not usually affected because when grinding the incisors the mandible is protruded directly or laterally. Remedial measures to be instituted by the dentist are very limited, and consist chiefly of repairing tooth wastage with filling materials. These do not prevent a continuance of the trouble and may prove to be unstable. The author suggests that strong crown or porcelain jackets are the most successful restoration.

Permanent and artistic repairs are difficult to make, so that it is well to detect the tendency early and give our patients proper advice regarding its correction. Enlist the co-operation of the patient's friends, who will point out the fault and, to some extent at least, mitigate its evil results.

If the grinding of the teeth takes place during the sleeping hours a mechanical device may be prepared as an aid in overcoming this habit. A small vulcanite plate, which covers all the molars and bicuspid, leaving the incisors free, might be worn at night, and so afford ample protection to the incisors. After a few months the habit will be corrected and the appliance may be put aside.

INTERPRETATION OF RADIOGRAPHS—THE APICAL SHADOW.

The time has arrived when the dental profession will have to take a decided stand upon the whole question of radiography. Under existing conditions incalculable harm is being done to the honest, conscientious "family" dentist by the dental "specialist," so-called, and the dentist who looks upon radiography as a "photographic side line." What do these men care whether dental ethics go to the winds so long as they get a substantial dividend upon their investment in a "machine."

For the purpose of showing that this view is not altogether parochial in type, let us quote from an editorial appearing in the *International Journal of Orthodontia*, February issue:

"With the adoption of the radiograph by the dental profession as a diagnostic agent, we find many things have occurred which are not exactly as they should be. With the medical profession claiming that devitalized teeth are sources of systemic infection, we find that a number of dentists have accepted that verdict without a question of a doubt, and have based their diagnosis entirely upon the radiograph. This diagnosis is often based upon the reading of the radiograph by one not properly versed in the interpretation of radiographs. Very often the diagnosis is made without any clinical knowledge of

the case. A radiograph is valuable only as it becomes an aid in conjunction with other means of diagnosis. We have known of teeth being diagnosed by the radiograph as 'dead teeth' when every other means of diagnosis showed them to be 'alive.' This is not the fault of the radiograph, but was the fault of some one trying to read into the radiograph what they could not see, and the disregard for other clinical symptoms. Those who acknowledge their inability to diagnose every condition from the radiograph are the least dangerous to the public—they realize that radiography is a profession and a specialty of dentistry, and can only be properly learned by a long course of professional training."

Again, commenting upon the unsatisfactory conditions now prevailing, the editorial says: "The radiographer does not know anything about the clinical history of the case, and the dentist for whom the radiograph was made has not had enough experience to properly read the film. The dentist does not know the conditions under which the radiograph was taken, the position of the tube, the time of exposure or the technique of developing the plate."

Taking up the question of interpretation, we quote again from one who has had considerable experience as an X-ray operator—H. C. Moxham, D.D.S., who writes in the *Commonwealth Dental Review*, January issue: "I know that it is quite an easy matter to wrongly read a film; for instance, the dark shadow between the apices of the roots of the two central incisors at first often denotes an area of rarefaction, when on closer examination an enlarged palatine foramen is discernible. Then, again, the walls of the antrum of Highmore are often seen overlapping the bicuspid and molars, and would lead one to believe that an abscess area existed, which in reality is nothing more than the natural air space, the bicuspid and molars being perfectly healthy. Further, the mental foramen is often so close to the apex of the root of the lower bicuspid that one is apt to be misled by the circumscribed space at the bottom. The floor of the nose also occasionally produces areas similar to abscesses around the apices of the superior teeth."

Taking up the question of the angle at which the radiograph is taken, Dr. Moxham has this information for us: "It has an important bearing on the result. Teeth are forelengthened or foreshortened, depending on the angle of taking and the position of the film; it is practically never a guide to measure the length of a root on a film and expect the measure taken to be exact. It has happened to me that on measuring the depth a plain brooch has entered an abscess area, I have been struck to find that it apparently extended quite beyond the rarefied area, as shown on the radiograph, but have found later that it did not penetrate beyond the circumscribed area as thought, but that the picture taken was foreshortened."

Then follows a statement that ought to be emphasized in the strongest terms possible so that the present enthusiasm for extraction may be stopped, and further loss of valuable tooth tissue incurred:

"After an apical abscess has made its appearance, subsequent root treatment, no matter how successful, will show little or no difference in a second film, unless the second ray be taken at least twelve months after treatment; even then the lime salts thrown down are more easily penetrated by the rays than in normal tissue. This same condition, of course, applies to fractures, the new growth showing lighter and less dense than the other parts, at first."

At a recent meeting of the Chicago Dental Society, Dr. C. N. Johnson, whose interest in the advance of good dentistry is known wherever the English language is spoken, took part in the discussion on this question of radiography, and in the course of his remarks made these statements:

"There is one individual in this whole situation who has been overlooked, and that is the family dentist. Too frequently he is forgotten in the shuffle unless perchance the patient happens to think it might be a good thing to consult him, and even then the patient stepping into the office of the family dentist with the X-ray in his hand and legion across it, 'abscess,' comes in with the preconceived conviction that he is suffering from a serious infection. I am going to make this statement that no X-ray man knows whether there is infection at the end of the root that has a shadow or not. What we want is a little *honesty*, a little *charity*, a little *breadth of view* in this matter. We have no right to leave in any mouth any infected area demonstrated to be infected. I also claim that before we condemn teeth for extraction, we must be sure that there is infection there. Let us look at this subject in a broad way, and let us think not only of the excitement of the present moment on this question, but let us remember the years and years—I was going to say centuries past—in which men of honor in our profession filled pulp canals and have kept patients alive, whereas that if all these things were true (concerning apical infections, etc.), half of our patients would have been dead years ago."

Many other leading dentists might be quoted here if space permitted, among others Dr. Truman W. Brophy, who said: "I think it is about time for the dental profession to rise in its dignity and proclaim to the people of our community that this thing (extractions, etc., based on radiograph findings alone) must end."

The purpose of this article might be best explained in the words of Dr. C. N. Johnson, quoted above: "What we want is a little *honesty*, a little *charity*, a little *breadth of view*."

If we have that, then the family dentist will have no fault to find with the radiograph specialist.

THE NECESSITY FOR CARE IN OUR CRITICISM OF DENTAL OPERATIONS.

If all dentists formed one large brotherhood and followed a policy of careful, considerate criticism of each other's work, the number of mal-practice suits would decrease very rapidly, and all would enjoy their work more than they do at present. We do not mean by this that it is necessary for us to become experts at "covering up" cases that exhibit gross negligence, but rather that we should guard our statements lest an innocent person's reputation suffer great harm.

Many illustrations might be given for the purpose of showing the danger consequent upon the giving of hasty and self-interested criticisms of other dentists' operations. Here are two cases which came before the writer's attention just recently: During the absence of her dentist, a lady consulted another practitioner regarding a defective third molar. He inserted an amalgam filling and the patient went away. Shortly afterwards the patient noticed a dark area on a bridge adjacent to the tooth in which the amalgam filling had been inserted, and she returned to the dentist about it. He examined the bridge and at once informed her that her dentist had made the bridge "from German silver and then gold plated it." Needless to say, such a finding was wholly wrong. What had happened was this: Some pieces of the amalgam filling material, which of course contained mercury, had come in contact with the gold of the bridge and coated it. The dentist who accused his fellow practitioner of fraud was himself in error as regards workmanship, in that he allowed the amalgam to reach the gold.

Another case: A lady suffering from an ulcer in the tongue consulted an old school acquaintance of hers who was practising dentistry. He had a skiagraph of the teeth made, and then pronounced a recently-treated tooth, which was far removed from the seat of the ulcer, being as a matter of fact on the opposite side of the mouth, as the source of the trouble. The patient returned to the dentist who had treated the tooth, and threatened an action for damages. Not being satisfied with the diagnosis given, the first operator insisted upon having the name of the patient's physician. After much persuasion and even threats, the information was obtained. Conversation with the physician elicited the information that the ulcer had been treated by him for some time, had no relation whatever with the teeth, and was a pronounced syphilitic ulcer.

In these two cases above cited, we may see how many lawsuits are instituted. In both cases the patients rightly believed that they were the offended parties, because they had been so instructed by dentists. Many of us perhaps will say, "Let these suits be instituted; the trial will show up the facts." This may be true, but then the dentist's reputation will have suffered, and this is not desirable.

Those who have made a special study of the question of lawsuits for malpractices find that at least 90 per cent. of such actions have had for their incentive the careless or selfish remarks of one dentist about the work done by others. We see then that if a successful effort is to be made towards diminishing this evil, we must begin at home. Let us all be guarded in our talk with our patients. A hastily-expressed opinion may result in incalculable harm to one of our number who may be quite undeserving of it.

Of recent years, legislatures both in the United States and in Canada have enacted, as a means for the protection of workers, The Workman's Compensation Law. Compensation for injuries received is brought about automatically, and there is no need for the employment of legal aid. Hence a very large and productive field is closed to the legal professions. As a consequence, more attention will be paid to claims against professional men and others. Wherever the Workman's Compensation Act has been enforced, there has always been a large increase in the number of lawsuits for malpractice against professional men. It is worthy of note that this act has recently come into force in Ontario.

The X-ray is also a great incentive to such actions, it being used as evidence of failure or imperfection in dental operations. That the danger of such actions is more acute now than formerly is evidenced by the increase in the rate demanded for liability policies in insurance companies. These companies guarantee the costs of defending an action up to a certain amount; beyond this amount they refuse to go. This in itself is an incentive for legal action against a dentist, because it is often better for a professional man to effect a settlement out of court rather than incur costs of action, such costs being likely to exceed the amount guaranteed in his policy. These so-called protective policies do not always protect.

The only chance of lessening the number of such actions where the plaintiff enters suit for damages, knowing his case to be ill-founded but hoping to secure some sort of settlement, would be to compel all claimants for damages to deposit a sum of money as court costs, same to be surrendered upon failure to establish a case. If this were done, a patient would go into the merits of his claim very carefully before entering suit, and in most instances would not initiate proceedings at all. As matters now stand, an enthusiastic lawyer will persuade the party to enter action, hoping to at least get costs by a process of compromise.

As a safeguard against losses through action for damages, the dentist ought to make a careful examination of each case that comes before him for treatment and estimate the chances of success or failure. If, with his skill, failure seems likely, then he will be wise not to undertake treatment unless a clear understanding as regards responsibility,

etc., has been reached with the patient. Again, dentists ought to conduct their practices in accordance with the latest teachings regarding asepsis, etc. If a patient comes to you with a view to having you undertake a certain operation, and you know that the said operation is beyond your skill, it would be best to candidly acknowledge it and refer the case to one specially qualified to treat the disorder.

The largest proportion of malpractice claims have been based upon faulty extractions. The removal of the wrong tooth, injury to adjacent tissues, uncleanliness resulting in infection, etc., all these are seized upon by those who would have the dentist pay for supposed injury. If we cannot govern the criticism of our fellow practitioners, we can at least so conduct our practice as to minimize the possibility of unscrupulous persons making capital of our failures.

PROPHYLACTIC MEASURES FOR THE ORTHODONTIST.

Orthodontic patients are young, and as a rule indifferent about the care of the teeth. The movement brought about by the arches, etc., cause soreness about the tissues, and this is given as an excuse for neglect in caring for the teeth. It is to be regretted that this is the case, for no other class of patients are so much in need of prophylactic attention as are those whose teeth are covered with cemented bands, ligatures, etc., all forming suitable lodging places for food.

Some suggestions for the care of such cases are given by D. Arthur Johnston, D.D.S., in the *International Journal of Orthodontia* (March issue). Orthodontic appliances are often placed on teeth that are in no condition to receive them. Rough enamel should be polished, cavities filled, septic teeth removed or treated, and in general the mouth put in a healthy condition. "Deep pits and grooves of the erupting teeth should be protected by flowing oxyphosphate cement over them as soon as they are accessible. This should be done before there is any possible chance for even an etched condition of the surface. This operation should be repeated when necessary until the teeth are in occlusion and the patient is able to take care of them."

While the appliances are on, the teeth should receive monthly prophylactic treatment, and as soon as they are removed all areas of the teeth ought to be gone over carefully, giving special attention to all etched enamel caused by loose bands, ligatures, etc. The experiment of having the dentist who refers the patient to the orthodontist do this work has proven a failure. The orthodontist has to take the responsibility if satisfactory results are to be obtained.

The following is a modified technic for the orthodontist, as given by Dr. Johnston: "One of the first steps is the removal of loose matter from between the teeth with the floss silk. Care must be taken to remove all deposits underneath the free margin of the gums.

"Roughened enamel and superficial decay is made smooth with fine carborundum and Arkansas stones, following up with fine garnet disks, about No. 6-0, and fine cuttlefish, using vaseline on the disks and water on the stones.

"Sensitive spots and superficial decay may be touched up with silver nitrate saturated solution. I have had the best results by drying the surfaces and rubbing in the solution with the wood points.

"If there are any synthetic or porcelain fillings, they should be protected with wax.

"The disclosing solution, the formula of which is iodine crystals, 50 gr.; potassium iodide, 15 gr.; zinc iodide, 15 gr.; glycerine, 4 dr.; aqua distillate, 4 dr., is applied to the crowns of the teeth and will show up the plaques, if any are left after treatment. This solution is good for inflamed gum tissue.

"The next step consists in the use of the dental tape run through moistened (Dr. D. D. Smith's) flour of pumice, which is carried to the approximal surfaces of the teeth. If any point between the teeth is inaccessible, the teeth should be wedged apart. The mouth should be washed out with warm water from a syringe, and the entire oral cavity sprayed, as this leaves a freshness which patients appreciate. With children it is a good plan to use a mouth wash that is pleasant to the taste.

"It is extremely necessary that patients be instructed in regard to home treatment and the proper way to use the brush. Every patient should have a water syringe (S. S. White & Co., Chip. Syringe No. 275), and the nurse or mother be shown how to use it in irrigating around the appliances when the toilet of the mouth is made before retiring at night."

Following Dr. G. V. Black's suggestion, the author recommends, "when the gingivae are sore and inflamed, after removing the local cause, physiological salt solution should be used in the syringe (S. S. W. Chip. Syringe No. 275) instead of plain water until the soreness is past. This should be done in a thorough manner."

Much may be accomplished in preserving the teeth from decay by the use of a suitable diet. "There can be no dispute over the fact that most of our dental disorders are affected by what we eat and how we eat it. The carbohydrate diet, such as pastry, fresh bread, syrups, and the washing down of food with liquids, is no doubt injurious to the teeth. A child should take enough solid food to insure a thorough cleaning of the teeth surfaces, and a habit of thorough mastication of such food should be encouraged so as to prevent the bolting of food. Finishing the meal with fresh fruit, especially apples, is good, as they help to remove any pasty materials sticking to the teeth."

MULTUM IN PARVO

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HELPFUL PRACTICAL SUGGESTIONS FOR PUBLICATION, SENT IN BY MEMBERS OF THE PROFESSION, WILL BE APPRECIATED BY THIS DEPARTMENT

IODIN AS AN ANTIDOTE FOR CARBOLIC ACID POISONING.—Dilute tincture of iodin, which is applied on the skin after irritation by carbolic acid, can also be applied as an antidote in cases of carbolic acid poisoning. Tincture of iodin exercises a favorable influence on the mouth and esophagus, and acts favorably even when toxic symptoms have already manifested themselves in the stomach and intestines. It probably forms a non-toxic iodized carbolic acid. Tincture of iodin may be considered superior to alkaline sulphates in these cases.—*J. Maberly, Union Pharmaceutique.*

ANTIDOTE FOR NOVOCAIN-SUPRARENIN.—In this country it has been ascertained by experiments that ether is a better remedy to employ in case of collapse from overdose of this anesthetic than anything else. In the department of experimental medicine in the University of Minnesota they gave animals an extreme dose producing convulsions, and revived them with ether. The conclusion was reached that the ether was the best antidote to use under these circumstances.—*W. H. G. Dogan, Dental Review (Dental Summary).*

A HANDY MATRIX.—For plastic fillings I have often scissored off a portion of an ordinary sandpaper disc and used this with rough side against adjoining tooth. With the aid of a silk ligature, the above makes a fairly decent improvised matrix band.

GREEN STAIN, so often seen in children's teeth, disintegrates the tooth structure, and should be removed. This can quite easily be done with a rubber disc and pumice moistened with hydrogen dioxide.

TREATING PERFORATIONS OF ROOT.—At this point allow me to state an easy method of treating and repairing a perforation of the pulp chamber or the canals, as this will occur in the best of regulated practices: A sedative dressing of equal parts of oil of cloves and beechwood creosote should be placed over the perforation and allowed to remain until the canal can be dried without hemorrhage; the perforation should be varnished with a solution of rosin in chloroform, and a piece of warm gutta percha should then be placed over the opening and pressed to place with a warm plugger. If the perforation is near the apical foramen, a gutta percha point will usually obliterate it. These operations should be checked by an X-Ray picture.—*F. C. Pearn, Northwestern Journ. of Dentistry.*

REFITTING TEMPORARY DENTURES.—In some cases temporary plates may be refitted by cleaning and freshening the palatal portion. Then covering with a piece of vulcanizable gutta percha which has been warmed in water of about the temperature used for modeling compound. Use this as an impression material. Chill in cold water. Trim and repeat until you have perfect adaptation. Flash and vulcanize.—*F. A. W., Dental Review.*

BRIDGES VERSUS PARTIAL DENTURES.—1. Bridge work, with its rigid abutments, is for a time more efficient, but no resultant damage can be remedied so easily as in the case of partial dentures. Any harm in such cases can be remedied before any damage is done to the remaining teeth and surrounding tissues. 2. In the majority of cases, partial dentures are more sanitary. 3. With dentures, porcelain can be used more freely than in bridge work. 4. Proper conservation of the tooth structure is more feasible with denture. 5. Longer period of usefulness possible with denture. 6. The successful bridge is the most difficult piece of work in dentistry.—*J. E. Nyce, D.D.S., in Journal Allied Dental Societies.*

INDICATIONS FOR EXTRACTION OF ABSCESSSED TEETH.—In abscessed conditions which cannot be relieved by treating, delay is dangerous and frequently fatal to the patient's life. Numerous cases are now on record where patients have died of septic pneumonia or septic endocarditis which has been traced to one or more infected teeth. In such cases, therefore, operation at once is indicated to save the life of the patient. The custom of some dentists to wait until swelling has subsided before extracting abscessed roots is wrong, and is unfair to the patient. Drainage should at once be established, and the most effective way to do this is by taking out the diseased roots.—*S. S. Swihart (West. Dental Journal.)*

TAKING IMPRESSIONS WHERE TEETH ARE MISSING.—Where there are teeth missing, especially where the molars have tipped forward, leaving a V-shaped space, it is sometimes very difficult to separate the impression and to bring out all the pieces accurately. This can be overcome by making a small plaster plug to fit the space before the impression is taken. This is done by placing some plaster in the space, and allowing it to set, after which it is trimmed so that it can be removed buccally. It is then removed, shellacked, and varnished, and coated with vaseline. Before taking the impression this plug is placed in position, when the technique following is the same as when taking other impressions.—*Internat. Journ. of Orthodontia.*

A CONVENIENT METHOD OF SOFTENING RUBBER FOR PACKING is to stretch a piece of towelling over the top of an enamelled basin. The water in the basin is kept boiling by a bunsen burner beneath it, and the steam passing through the towel softens the rubber without allowing it to stick to the towel.

ORAL HEALTH

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Vol. VII.

TORONTO, AUGUST, 1917

No. 8

EDITORIAL

Why Not?

THE city hospital is now beginning to be the "home, sweet home" of the many sick who occupy our boarding and apartment houses. The members of the medical profession have been quick to recognize this tendency and have adopted the practice of sending such patients to the hospital for an illness which promises to be of even short duration or for a minor operation. This treatment is most satisfactory to both patient and doctor; the patient receives better care and attention than is possible in the ordinary boarding house, and the physician has less anxiety, knowing that his patient is in good hands and that he will be immediately notified in case any unfavorable symptoms become manifest.

The city dentist has not made the best use of hospital facilities. In many cases patients without home or friends in the city have been encouraged to come to his surgery office to have a general anaesthetic administered and a serious oral operation performed. After being given a few instructions, they are allowed to go to their apartment, there to care for themselves as best they can. How much better it would be to send such patients to a hospital, where the operation could be performed under ideal conditions and the patient turned over to

the dental interne and nurse to be properly treated, nursed and nourished until fully recovered from the effects of the anaesthetic and the operation.

The results of such a method would be eminently satisfactory to the operator, as he would be relieved of worry, knowing that the danger of injurious consequences from the anaesthetic or a possible hemorrhage or infection had been obviated. In cases where a large number of teeth had been extracted, the patient might stay at the hospital until a temporary substitute had been provided. The hospitals are ready to supply the necessary equipment and service as soon as the demand is created.

F. J. C.

Personal Mention

MAJOR CHARLES A. CORRIGAN, D.S.O., for more than 20 years connected with the Queen's Own Rifles of Toronto, has been appointed Deputy Assistant Quartermaster-General, according to a cable from London. Major Corrigan left Toronto with the A.S.C. in August, 1914, holding the rank of lieutenant, and in June, 1917, was reported wounded in the hand and thigh. By a coincidence he was sent to the clearing hospital where his wife was serving on the nursing staff. Since landing in France, Major Corrigan has received the D.S.O., his promotion to major, and the long service decoration. He received the D.S.O. for gallantry at the Somme, and shortly afterwards was offered a post in England, with promotion, but at that time declined. Dr. Corrigan has practised dentistry for many years in the city of Toronto.

Capt. J. W. Bell, D.D.S. '94, who was for several months in the C.A.D.C. in England, has been invalided home and has resumed practice in Hamilton.

Capt. H. F. Alford, D.D.S. '15, who was invalided home from Salonica last autumn, is now in London, and suffering from a return of malaria.

Capt. G. H. Bray, C.A.D.C., D.D.S. '05, is now in France attached to a field ambulance.

Capt. J. T. Adams, D.D.S. '12, is now with the C.A.D.C. in the Second Training Brigade at East Sandling.

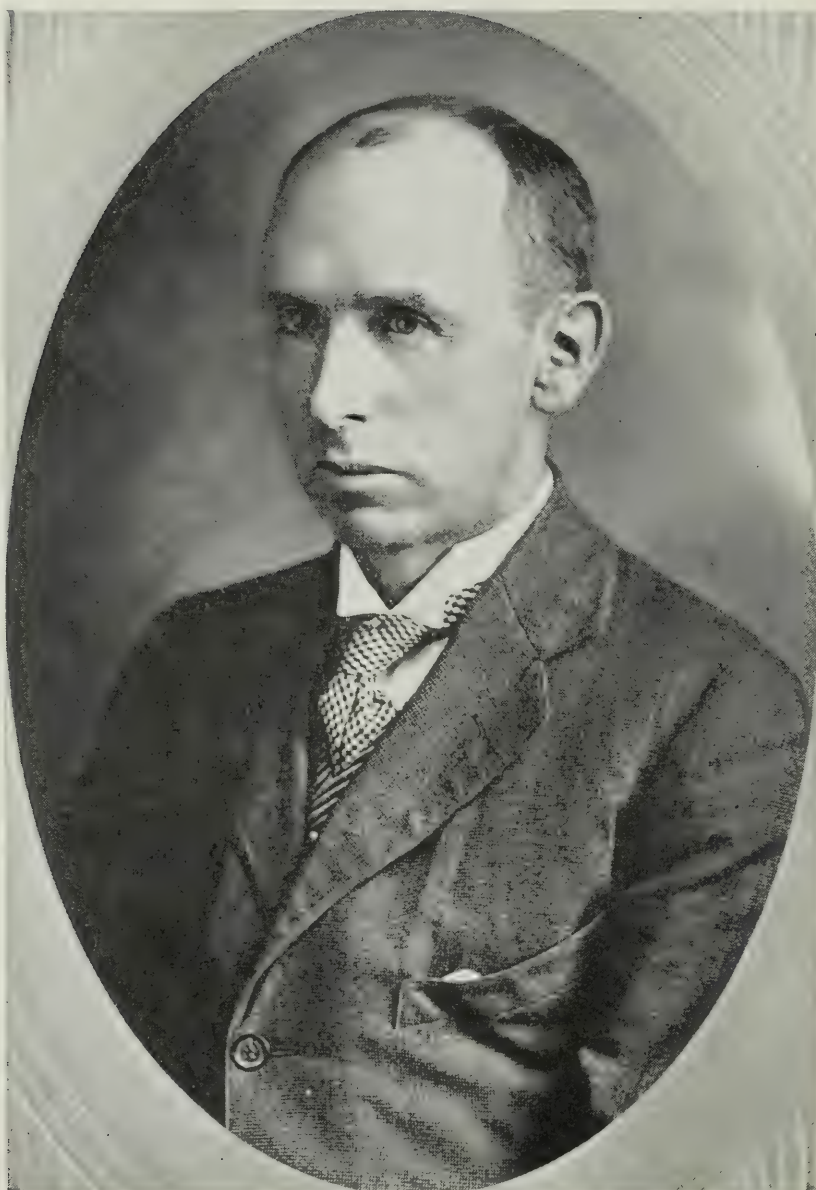
Capt. W. H. Gilroy, D.D.S. '11, has transferred from the C.A.D.C. to the R.F.C.

Sergt. A. E. Chegwin, Dent. '18, who enlisted as a private in the 198th Battalion, is now in the C.A.D.C.

Pte. E. V. Elliott, Dent. '18, formerly sergeant, C.A.D.C., has transferred to the infantry and is in the 12th Reserve Battalion.

True Economy

DENTAL treatment for school children will, it is estimated, cost the London County Council £16,580 this year.



J. F. SIMPSON, D.D.S.
TRENTON

President-Elect, Ontario Dental Society.

ORAL HEALTH

A JOURNAL THAT STANDS FOR THE "OUNCE OF PREVENTION," AS WELL AS THE "POUND OF CURE"

VOL. 7

TORONTO, SEPTEMBER, 1917

No. 9

The Relation of Dental Disease to General Disease. Dental Service in the Modern Hospital.*

M. T. MACEachern, M.D., C.M., GENERAL SUPERINTENDENT
OF THE VANCOUVER GENERAL HOSPITAL.

THE dental profession and medical profession are not so far apart in reality. The work of each overlaps to a certain extent and the dental profession finds a place in the field of Preventive Medicine. The modern hospital has its dental department with members of the dental profession on its attending staff.

Normally the mouth is protected against bacteria action by the presence of the salivary secretion. This juice acts in a somewhat inhibitory way on bacterial growth, more from a mechanical than aseptic standpoint. The organisms are prevented from becoming fixed and are washed away in the saliva, thus curtailing those conditions necessary for bacterial growth and multiplication. The different types of bacteria in the mouth are exceedingly varied and possibly there can be found here all the Pathogenic Bacteria that have been recognized. In fact the mouth is a great gate-way to infection of the body. By taking tooth scrapings from healthy mouths, bacteriologists have proven that six to eight million bacteria to the milligram are present, whereas in diseased mouths this number is increased to six to eight hundred million. Further analysis show that 44 per cent. of the bacteria belong to the streptococci family, and 18 to 25 per cent. to the Staphylococci family. The former grow much more rapidly. The greatest number of bacteria in the mouth are found between the teeth, at their necks and upon those surfaces that are not

*(Read before the Vancouver Dental Society, Friday, April 20th 1917)

disturbed by mastication. Here growths are more abundant. Broken down or decayed teeth form a ready avenue for the access of septic infection to the circulation. The gum margins receive and retain at all times, great numbers of these bacteria. Any crack or crevice in this region therefore permits the ready entrance of bacteria into the surrounding veins and lymphatics. It is estimated that the total length of the gum margins in an average person is 30 inches, and that the total area on which bacteria may grow is 20 to 30 square inches. Thus a large number of bacteria can develop in a short time. Hence the broken down tooth, with its open pulp canal, or a badly filled, devitalized tooth becomes a direct avenue of inoculation. These two avenues may therefore be the means of conveying into the circulation great numbers of bacteria and so scattering them into the blood stream, causing secondary lesions of the heart, joints, brain, liver, lymphatic glands or gastro intestinal system.

Charles Mayo, of Rochester, says that the greater number of people to-day die of a simple infection and that 90 per cent. of them die owing to the outcome of some simple infection of a local nature, the primary focus not necessarily giving any trouble itself. Ninety per cent. of these local infections arise above the collar line, found in such conditions as diseased tonsils or antrum, nasal discharge, sinuses, and the vast majority from dental infections. This opens a large field for the dentist and scope for lots of research work yet to be done regarding the relation of these suppurating foci to systemic diseases. Bacteria in the mouth causing no local reaction, are more dangerous than any other, as no resistance or anti-bodies are produced. If these organs produced more of a local reaction proper anti-bodies would be thrown out into the blood stream and an immunity established.

Pyorrhoea alveolaris is receiving attention to-day. It is a low-grade suppurating alveolar periostitis, originating at the angle between the gum and the tooth and gradually working towards the end of the root and resulting in loosening and falling out of the teeth. Many pathological conditions throughout the body subsequently arise owing to the constant discharge and absorption of pus so produced. This may take many forms, but most frequently do we see chronic gastritis and anaemia, chronic heart affections and chronic joint diseases. Tartar around the teeth usually precedes this condition. Portions of food, cell debris, etc. collect and decompose at the angle between the tooth and the gum, and bacteria flourish there. Calcareous salts are also deposited in this broken down material, so that soon a calcified layer of extraneous matter coats this part of the tooth and extends between the tooth and the gum.

The relation of pyorrhoea alveolaris and other suppurating matter about the teeth to systemic disease is very apparent, when one studies the many cases presenting in daily hospital practice. From all that

can be gathered from statistics compiled by careful experimenters and writers we must conclude that various systemic diseases are contingent on pyorrhoea alveolaris and chronic focal dental abscesses. In other words, the teeth may be held responsible for a great deal of the suffering of humanity. However, we must not conclude that the two conditions mentioned are the cause of all diseases.

A very interesting point which has been referred to by writers in connection with the frequency of these chronic mouth conditions, associated with systemic infection, is the fact that in the examination of a number of people belonging to the poorer classes, there are relatively fewer chronic diseases or infections than in the better-to-do. This may be explained by the fact that poorer people, including the foreigner, usually have their aching teeth extracted earlier.

Infected pulp may be due to caries, to faulty technique in root canal treatment, or failure to seal the root canal and pulp chamber properly when introducing the filling. The secondary infections are carried by the blood stream. Alveolar abscess develops more rapidly when there is a lowered resistance in tissues, which may be due to some chemical agent or trauma. Circulation is interfered with by the inflammation set up. Then abscess develops. It is indeed hard to say which is the most serious, chronic alveolar abscesses or pyorrhoea. Of course in the latter there is more pus.

Of all the diseases which seem to be subsequent on these marked conditions mentioned, chronic arthritis or joint disease is the commonest. Frederic B. Moore, Presbyterian Hospital, Chicago, cites 718 cases of which 498 were chronic joint conditions. These arthritic conditions are usually of a very chronic nature and obstinate to treat, many of them continuing for some time before the cause is ascertained. Secondary infection may manifest itself in any part of the body. Not only do we see it in the locomotor system, but also in the cardio, vascular, the gastro intestinal, the renal, the lymphatic and other systems. We see many cases in Hospital work, where we cannot put our finger directly on one or the other system, but the patient seems to be in what is popularly known as a "run-down" condition, says he feels kind of "draggy" and "ambitionless," and expresses a feeling of continual lassitude. There may be a moderate degree of anaemia and loss of appetite, with a coated tongue.

All authorities lay great stress on streptococcal focal infection. This is responsible for many conditions in the body. Interesting statistics have been quoted recently by Dr. Ulrich of Minnesota University, where 500 cases were subjected to X-ray examinations. There was found to be 1,350 bad teeth and 1,108 or 83.42 per cent. were abscessed. Other series of 117 patients were examined and these included all classes, charity and private. He reports 372 bad teeth with 317 abscessed or 85.2 per cent. The largest percentage of all these cases was streptococcal in type. Hartzell also finds

similar conditions in his series. These streptococcal focal infections distribute their toxins throughout the system and these toxins seem to have a distinctive property and wide range of effect, on the various structures. Authorities in giving their results of investigation along these lines, refer to a large variety of abscesses due to streptococcal focal abscess, and pyorrhoea conditions such as rheumatoid conditions, cardiac diseases, secondary anaemias, arteriosclerosis, viseroptosis, neuritis, gastro enteritis, kidney diseases, etc. In addition we must not overlook the fact that diseases already at work in the body (from other causes) are much aggravated by the constant absorption. The resistance is much lowered. I have heard of several cases suffering from mental diseases improving greatly after treatment of the teeth which were badly abscessed. I recall a case at present where, after over a year of suffering, the patient is now at work having had the teeth attended to and an end put to constant absorption of toxins. In hospital work we often see conditions clear up and patients put on flesh after dental treatment. In determining the prevalence of these conditions one must confine investigation to adults, as there are other conditions likely to be responsible for chronic diseases in young people, where, for instance, the tonsils may be to blame. Pyorrhoea in people under twenty-five years of age is comparatively rare, and of course, is commonest between twenty-five and sixty years, decreasing in old age. The damage done in many cases cannot be undone, although the teeth have been treated or extracted. The infection should be removed as soon as detected.

I have very little to say about the treatment of pyorrhoea alveolaris and focal abscess. You, as practising dentists, no doubt are familiar with all the modern methods. However, you are no doubt all agreed that prophylactic measures ought to exist. Modern medicine concerns itself more with the prevention of disease and nowhere is it more applicable than in such diseases as arise from the condition of the mouth. The hygiene of the mouth should be well inculcated into the child. Several of the larger cities are doing excellent work along these lines by means of well arranged dental clinics and dental inspection of school children. Proper hygiene of the mouth is as essential as the taking of proper food.

In the treatment of these conditions a two-fold object is kept in view. Firstly to save the teeth if possible, and secondly, to rid them of infection. Indeed it is often difficult to say which teeth can be saved and which not. From a pathological standpoint it can be said that such teeth can be saved where the circulation is not interfered with, and where too much of the peridental membrane has not been destroyed. Recently emetine was used a good deal, with very doubtful value as a routine treatment.

The treatment of alveolar abscesses or focal abscesses may be considered from two standpoints, conservative and radical. In the

first the tooth is treated and saved and we believe infection has been removed. In the conservative method the root canal is opened, disinfected and filled. Some estimate that such a procedure saves only 25 per cent. of cases so treated. It is indeed difficult to say which tooth is harmless and which is not, but if there is any doubt and the patient is feeling any ill effects from it, removal is advisable. There is no doubt but that many teeth are removed unnecessarily, but this may be justified in view of what may result. Saving teeth which perpetuate chronic infection is bad practice. The functional value of an infected tooth can never compensate for the harm it might do. The aim of the dentists' work should be to conserve health.

In treating pyorrhoea one or two teeth only should be treated at a time, with a period between, as it frequently happens that where too many such pockets are disturbed at one time there will be malaise following such treatments, and a rise in temperature with an exacerbation of symptoms of disease present. In a case of chronic arthritis all the joints may become swollen, sore and tender as a result of disturbing the bacteria in the pockets. In a case of myocarditis over inoculation from treatment may set up an increased rate of heart's action and other symptoms. This damage may be done by over treatment and one must go guardedly. If the inoculation of the patient is not enough to disturb the course of the disease by an acute exacerbation of symptoms, an immunity is set up which is distinctly beneficial. For instance, many cases of arthritis which have resisted all therapeutic measures begin to improve immediately. This is no doubt due to two things. Firstly, the lessening of the amount of bacteria; secondly, the vaccination of the patient in the act of treatment. To illustrate the above I cannot do better than to quote the case as reported in the "Modern Hospital," November, 1916, number, by Thos. Hartzell, of the University of Minnesota.

"January 18th, 1916. Mr. J. J., age 43, white, married, a mechanic by trade. Had not lost a single day's work in three years. Experienced distress with his teeth. He appealed for dental service. The operator in charge examined the mouth and found a loose bridge resting upon two abscessed teeth, which also exhibited a copious pyorrhoea. The bridge, with the two abscessed teeth was removed, together with three other loose teeth. That night the patient experienced a chill, followed by a fever, which steadily increased. All the joints of the body became rapidly involved, one after another. He experienced a typical inflammatory rheumatic attack. Was given the usual treatment by his physician. Eventually the acute stage passed, leaving the patient with feet drawn up almost to the buttocks, one wrist exhibiting an almost silver fork deformity, with the hands crossed upon his breast about the level of the sternum. When seen by the writer about the middle of May, the patient had been in bed continuously since January 18th, and for the previous

six weeks had made no progress toward recovery. He was unable to lift the hands to his face or extend his legs. On examination it was found that he had several abscessed teeth, together with considerable pyorrhoea of the remaining vital teeth. In view of the joint fixation and atrophy, the case seemed hopeless. Directions were given, however, that the diseased teeth in the mouth should be removed and the sockets curetted, one at a time, and that a period of seven days should elapse between each extraction and curetment, and that, if the patient experienced much exacerbation of the joint symptoms, the time should be lengthened to nine days between the operations. If he did not experience exacerbation, the time of interference might be shortened to five days. These directions were carried out, and following the removal of the first abscessed tooth and the curetment of its socket, a sharp reaction was followed by a definite improvement in the general conditions of the case. The diseased areas in the mouth were gradually and cautiously eliminated, and it was insisted that the men in charge of the case should husband the dental lesions as they would a valuable remedy, as the ultimate recovery of the case depended entirely on the manner in which they carried out this treatment. The result has been that the patient is now out of bed, is beginning to walk, is quite able to wheel himself about in a chair, and can feed himself. No therapeutic treatment has been administered since the beginning of the surgical treatment of his mouth lesions."

In such a case where the patient seems to be saturated with bacteria toxins care must be taken in disturbing these sources. The treatment must be gradual. The slow elimination of the bacteria and toxins is necessary to produce the inoculation of the patient with such an amount as may be extremely protective and beneficial, and which may in due time effect a cure. In conclusion, I beg to again refer to the importance of mouth sanitation, which, if carried out properly, will reduce the number of diseases dependent on this kind of infection. Some authorities even state that if all the hospital records were analyzed, 30 to 50 per cent. of admissions of medical cases could be considered suffering from diseases of poor mouth sanitation. All patients entering the hospital would gain greatly if their mouths and teeth were examined as part of the routine examination. The early cleansing of the mouth is as necessary as the initial bath. More care and more attention to the mouths and teeth of hospital patients would certainly hasten convalescence, in addition to the educational value it would have. The dental department in the hospital is therefore essential, and every hospital should have a proper room set aside for same with the necessary outfit. The X-ray is not of great assistance for diagnosis, and no doubt soon will find a place in every dental office as it does now in every hospital.

Note on Flavine Sodium Desoxycholate and Quinine as a Mouth-wash*

BY F. M. WELLS, MAJOR C.A.D.C.

(From the Canadian Army Dental Corps Laboratory, London, S.W.)

IN the estimation of the value of chemical substances at present employed as antiseptics in the mouth and throat there is a sharp division of opinion as to the advisability of employing antiseptics in the treatment of infections where the chemical is brought in contact with such a delicate structure as the mucous membrane. Any chemical which would act as a bactericidal agent, which at the same time would not destroy the life of cells and inhibit phagocytosis, and which could be applied to such a delicate surface as the mucous membrane without causing an irritant action, would satisfy a long-felt want in mouth and throat treatment.

I have in the course of the last ten months examined a series of substances comprising the principal antiseptics, washes, lozenges, pastilles, etc., in common use.

Neufeld has shown that bile salts have a solvent action on pneumococci, but not on other bacteria. Bile salts also dissolve completely leucocytes, spermatozoa, amoebae, spirochaetes, and trypanosomes.[†] Mair has brought evidence to show that scarlet fever is due to a pneumococcus-like organism which is also bile-soluble,[‡] and has indicated that there is reason to believe that "trench nephritis" is due to a similar bile-soluble diplococcus. Mair found that the solvent action on pneumococci of sodium desoxycholate was ten times as powerful as sodium cholate or the commercial sodium taurocholate.[§]

These bile-soluble diplococci show also a special sensitiveness to solutions of quinine, and there is evidence that a combination of desoxycholate and quinine has a much greater bactericidal effect on them than can be accounted for by a mere summation effect.

A solution with the following formula:

Quinine hydrochloride	5	grams.
Sodium desoxycholate	40	"
Glycerin	250	cem.
Water	to 1,000	"

has been in use in the form of a fine spray for the throat and nose in cases of scarlet fever for some months, with results so far satisfactory that they show that the treatment does no harm, and that septic throats clear up with it at least as rapidly as with any other form of treatment.

Messrs. Allen and Hanburys are now preparing tablets containing:

Sod. desoxycholate	gr. 1
Quin. ethyl. carb.	gr. 1-8
Ol. menth. pip.	m. 1-20
Glycyrrhiz. ammon.	gr. 2
Also with flavine 1 in 1,000.	

*British Medical Journal, July 7th, 1917.

The quinine desoxycholate solution has a considerable bactericidal effect also on other cocci which are not bile-soluble, and in the strength used it appears to have no irritant effect on the mucous membrane.

The method employed to test the value of the preparations checking the development of bacteria were all carried out in the same mouth; only one test was made in twenty-four hours. The mouth was first rinsed thoroughly with distilled water, and after thirty minutes the saliva was expectorated from the mouth into a sterile test tube, and then a loopful inoculated into nutrient agar and plated. At the end of an hour another test was made in the same manner. These tests were used as controls. Immediately after the second control the substance to be tested was rinsed thoroughly over the mouth, and then tests made in the same manner every half-hour up to the fourth hour. Plates were incubated for twenty-four hours and counts made. The most favorable results were obtained from a solution containing:

Desoxycholate	2 per cent.
Quinine	0.25 per cent.
Flavine 1 in 2,000.	

Judging from the chemical action of the desoxycholate and quinine tablet, it should be an excellent treatment for infected throats, as in the strength used in these tablets all the pneumococci strains are easily destroyed without causing any irritation on the mucous membrane. This pathogenic group alone is giving more trouble than any other strains to be found in the mouth and throat. Again, amoebae are very easily cleared out of the mouth with sodium desoxycholate and quinine in the strength used in these tablets, as I have found in cases of pyorrhoea caused by amoebae.

In the solutions containing desoxycholate and quinine and flavine the bacterial count, even after four hours, was in most cases considerably lower than the control before treatment, whereas with the more irritating antiseptic solutions the count rises rapidly after the initial fall until it reaches a figure in excess of the normal. I consider this secondary rise in the number of bacteria to be a useful indication of an irritant effect on the mucous membrane. The same difference is seen in comparing the effects of the one per cent. carbolic and the desoxycholate and quinine tablets. The latter do not show the same reduction in the number of bacteria as the corresponding solutions, possibly because the effect in the mouth is somewhat localized. At the same time the effect on the throat of the slowly dissolving tablet should be greater than that of a mouth-wash, as the swallowing of the saliva in which the tablet has dissolved keeps up a continuous action on the mucous membrane of the throat.

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Medicine and Dentistry in China

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MANY articles have been written and published of the skill of the native dentists of the Orient; these accounts have dealt with various accomplishments, such as the extraction of teeth with the fingers or the ligaturing in the mouth of carved ivory, bone or wooden teeth, but after ten years of practice in West China, I have not discovered that any operation of lasting benefit, other than extraction, has been performed in this part of the country. It is true, that, at times, toothache was relieved by the use of drugs, such as purgatives, anodynes and antipyretics, but no attempt has been made by a regular practitioner to permanently cure oral diseases, and this lack of dental attention led to the practice of various fraudulencies which were, and still are, relentlessly and without restriction, perpetrated on the credulous and simple, and the greater majority of the Chinese have shown that disposition to believe on insufficient evidence which is the prerogative of human nature the world over.

The Chinese language contains many phrases which give us proof that the importance of the teeth was early recognized and that at some time in the distant past an attempt had been made to study the growth and general characteristics of the teeth, but apparently, during the last two or three centuries, that study has been quite neglected. The language also contains many phrases in which the use of the word "teeth" indicates that something was known of their importance and purpose, but though these expressions were those used in ordinary conversation, they have now become quite or almost obsolete in the spoken and are now used only occasionally in the written language. The following are examples of this, 好齒音, "good tooth sounds", meaning a fine voice as a speaker; 不好啓齒, "It is awkward to open the teeth", viz., "It is awkward to broach the subject"; 生齒日繁, "the number of teeth increases daily", "teeth" meaning people; 沒齒, "no teeth", viz., death; 尊齒. "Your venerable teeth?" "How old are you?"

I have not been able to discover any book or books on dental subjects, nor can I find mention of the teeth in any scientific sense in any literature. The macroscopical surfaces of the teeth have not even been differentiated, in fact, the only distinctive appellations are, "big and little door teeth," meaning the anterior teeth; and "big teeth," meaning the posterior teeth. As for the pulp chamber, it is not supposed to occur in a healthy tooth, but rather indicates the diseased condition of being "worm-eaten." These facts, however, should not occasion us much surprise when we realize that the

Chinese physician has not been permitted to dissect the human body and an extracted tooth, the only one available for any examination, being a diseased tooth, was not normal. In China with its ruling religion that of ancestral worship, the desecration or supposed desecration of deceased body would and has occasioned many turbulent uprisings of the people. Thus most of the knowledge which a medical man has been able to acquire has been through the dissection of various animals which naturally has been of practically no assistance in the study of the anatomy of the human teeth. And as the medical man has heretofore given all the dental attention which was demanded, dental anatomy and histology has had scant attention. Before the advent of dental practitioners from the West there was no term for "dentist" in the language.

The practice of medicine in China is divided into two main branches, the surgeon, 外科, and the physician, 内科. In the past there have been no medical schools and no training, other than aptitude for the work was demanded or deemed necessary, to enter the practice of medicine, and even to-day, the utmost that is required is the ability to pass an examination conducted by the police, which in the nature of the case, is quite farcial.

It may be of interest to mention a few drugs in common use. I fear that it would be difficult, even with a long stretch of vivid imagination, for one to find a sponsor for them among the members of the medical fraternity of the Occident. Mica is used for delirium; lodestone, pulverized, mixed into a paste and spread over embedded bullets, is supposed to draw them out; pulverized tiger bones or ivory made into a paste and then spread over the skin covering fractured bones will help them to knit; powdered gall stones are also used in delirium; centipede salve is used for burns; burned hair and boys' urine is prescribed to stop external and internal bleeding; steeped cicada skins loosen the abscess scabs in smallpox; the fetal sack, dried and macerated, is used for a tonic; pearls, pulverized and washed, are employed in eye trouble and eagles' claws are beneficial for bruises.

Beside the general divisions of the practice of medicine mentioned above, there are thirteen specialities. These are practised most frequently by quacks, who, with a little knowledge, a superabundance of ability to play on the superstitions of the people, combined, perhaps, with sleight-of-hand and other artful means, attract much attention and gather in a considerable revenue. As examples of the specialities, we have the smallpox vaccinator, who, in the old days, had his patients inhale the vaccine through the nostrils; the acupuncture specialist who wins confidence by pushing a needle through the limbs without the drawing of blood or the slightest pain; the chiropractic or manipulator of any sprain or stiffness, who, by pressing and pushing it the proper point gives relief. These men,

without doubt, have some knowledge of the body, and though their practice is entirely empirical, it is at times of benefit. This, unfortunately, cannot be said of other members of this class. Magic and spells have a large share in the methods of some so-called physicians, especially among those patients whose diseases have defied the skill of the ordinary practitioner. Of these, the "kua fu," charm writer, is of most interest to the dentist, and especially the water-charmer, for amongst his varied accomplishments, he guarantees to extract teeth without pain. His method of procedure to procure the painless results is somewhat as follows: He examines the tooth, then filling a bowl with water, lights candles and incense sticks and chants prayers to his particular deity, meanwhile writing figures on the surface of the water. This part of the ceremony being completed, he extracts the tooth, and, immediately, before the patient has time to utter a sound, has him fill his mouth full of the charmed water, which he is told he must not, on any account, spit out until he is given permission to do so, this at least, prevents him from giving vent to his first impressions; but as to whether he really has pain or not depends on several factors, his sub-consciousness may have him well under control or he may be comforted with the explanation that "it might have been very much worse", or as I suspect, the true explanation comes through my discovery that the extraction of a firm tooth is seldom, if ever, attempted, and further, because this fact is generally known, the charm writer is seldom, if ever, confronted with a patient who would cause him to lose face by the necessity of a refusal to perform a painless extraction. Many times I have been informed by patients that they have been loosening a tooth which they wish extracted for some weeks previous to their appearance at the office, and it is almost an invariable rule that after the injection of the local anaesthetic, and, as I am about to extract, the patient will try to dissuade me, for, as he says, "the medicine has not yet loosened the tooth."

Belonging to the same class as the water charmer is the egg-charmer, who is called in to cases of both sudden and lingering illnesses. He selects an egg and after weaving an appropriate spell by many incantations, writes mystic figures on the shell and ties about its centre a thread, then to prove that he controls the spirit in the egg he holds it suspended and commands it to turn, stop or reverse as he may desire. The egg is then placed in a shallow hole dug in the mud floor and prepared coarse paper cones, into which have been poured a little oil, are one by one placed over it and burned, after which the egg is broken and eaten. If the patient does not improve within a reasonable time more eggs are prepared. A further proof of the ability and genuineness of the doctor is proven by the fact that though the egg is thoroughly cooked by the flames over it, the thread has not been burned.

It would seem that all classes of society believe in these magical healing methods, but the women of all ranks, because of their lack of education and the ancient custom which keeps them virtually prisoners in their own compounds, are the usual victims. To meet this condition a number of the specialities are practised by women who have easy access to the homes. Of these we have the clairvoyants, of which there are several classes. There are those who call up dead relations who give advice of all kinds, especially in cases of trouble; others have direct access to the spirit world as the Flower and Fruit Inspectors, who, on inspection of the spirit gardens, can inform you if your own special flower or fruit is defective. It is an almost universal custom to give a boy a fruit name and a girl a flower name at birth. A blemish in the flower or fruit will cause illness and so must be overcome, which is usually effected by having a paper imitation made of the required tree or plant which after appropriate ceremonies is burned and ascends to the garden of the spirits to replace the blemished one. Another somewhat interesting woman specialist is the 卦算子, Worm-extractor, or as the Chinese characters imply, "one with the gift of the gab." This female makes her living by the use of a persuasive tongue and clever fingers. She professes to remove worms from the eyes, nose and teeth and thereby cures the ailment. The worm theory of disease has a very large place in Chinese thought. When need arises the 卦算子 is called in, she first bargains to remove the worms at so much a piece or so much for the job, it hardly matters which method is decided on, for if it be the first she will remove as many as the patient will monetarily stand for. If the second a shrewd bargain is made and a quick operation is performed for but few worms are found. Should the case be a dental one, her method is, first, to wipe out the cavity in the tooth and transfer to it by sleight-of-hand methods a number of worms, which have been proven to be the willow tree grub or the rice worm. She then removes these before onlookers who are quite convinced that they are seeing the identical worm which has eaten the tooth. After all the grubs specified in the contract are cleaned out, the cavity is packed with lime on cotton wool, which, in the first stages of decay, will probably keep the tooth from aching for a few days. There is a belief to the effect that this woman must not be offered the customary courteous cup of tea, for should such be done, she would acquire a knowledge of the place where the valuables are kept and later would steal them. Her supposed method of this purloining is as follows: A small wooden image of a child is placed before candles and incense, she then prays to her gods and repeats charms and spells after which a spirit enters into the image, who is then directed to secure the desired choice articles and bring them to her. One can readily understand why this fair lady could not indulge in the universal cup of tea if she wished to preserve her stock

in trade which she keeps in her mouth, and surely her little plan to avoid the calamity has been nicely worked out.

Let me now return to the practice of the regular medical man. To the Surgeon falls the work of extraction, which is only requested as a last resort. As far as I have been able to learn, teeth are actually extracted by three methods. First, if the tooth be very loose it is wrapped in a coarse fibre paper and with the strong and practised thumb and forefinger, it is rotated or luxated and with a quick pull is withdrawn. Secondly, when it is necessary to extract a firmer tooth, a pair of crude pinchers with plain beaks are employed, and, thirdly, if the pinchers fail, a short iron or brass bar, called a 藥尺, medicine rule, is used to give the tooth a sharp, quick blow, which may or may not knock it out or break it. We can, I am sure, well understand the deep-seated fear, that is quite general, of tooth extraction, and can readily believe that every opportunity is given the 內科, physician to cure the ache, or the pain is endured until a sinus is formed.

Some of the methods of the application of drugs and the drugs themselves may be worthy of mention. Most medicines are taken in their crude state and it is necessary to swallow several quarts of a brew to obtain any effect. No effort is made to more than roughly clean the drugs, whether they be bulbs, bark, stalk, fruit, flower, seed or leaf, but though there is no attempt at refining or eliminating useless bulk, there are regular and important rules observed in the preparation of most of them. For example, in the preparation of Shu Di, 熟地, it is imperative that it be cut up, sundried and steamed in proper order seven times each, before it is fit for use. Crude drugs in the form of roots, bark or pulp are laid on the gum over the root of the aching tooth. Drugs, such as camphor, are powdered and placed in the tooth cavity. The smoke from the drug, Kao Pen, 藁本, which has been placed between tobacco leaves, is drawn into the mouth through a long-stemmed pipe, the stem of which is put in the cavity. Other drugs are placed in a shallow vessel over a lamp, the whole enclosed in a bamboo sheath formed into a funnel from which the vapour is drawn and directed into the cavity. Mouth washes are made up of drugs such as camphor and powdered gypsum, and, of course, many drugs are taken internally for the theory of toothache is that it is a reflex pain caused by some disease in the internal organs. Pain in the upper right incisors is referred from the heart and Hwang Lien, 黃連, is administered; pain in the lower incisors is referred from the stomach and Shi Kao, 石膏, is given; pain in the upper right bicuspid and molars from the right kidney and in the lower left bicuspid and molars from the left kidney. And, finally, as chuan pi is administered in all bone pains, it is always given as well.

The terms used by the Chinese to differentiate the several varieties of tooth pain give us somewhat of a clue to their ideas of the etiology of the trouble. A tooth with a cavity is called a 虫 “worm tooth”, a tooth about which there is swelling and inflammation is called a 火 . “ho yah”, a fire tooth, while one that has pain but no swelling or heat is called a 風 牙 , “feng yah”, windy tooth.

My observations have led me to believe that on the whole the Chinese of Sz Chuan have fair immunity from decay, but I am not yet prepared to give any reason for the condition. The diet of the poor and working classes is mainly rice and vegetables, with an occasional bowl of meat added, probably not more than twice a week at the most. The rich eat a great deal of meat and sweetmeats, and it is among them that we find the large bulk of defective teeth. There is a very interesting fact which I hope will be worked out in the future and that is this, that there are only three main food flavorings, sugar, vinegar, and peppers, and that individuals, as a general rule, use one to the exclusion of the others.

There is no general consciousness regarding the care of the teeth. Some dozen years ago the Japanese introduced the tooth brush into the province, and to-day it is manufactured by the native brush-makers, but it is of a very poor type and not in very general use. The first and foremost cleansing agent is the facecloth wrapped round a finger and used as a swab. When travelling through the country one may see, on rising in the morning, the guests of the inn, each in turn, making use of the facecloth provided, first for his face and then for his mouth. The one redeeming feature in this procedure is the use of very hot water, much hotter than the ordinary westerner could bear on his skin.

Children have little, if any, attention paid to their teeth. The temporary teeth are not considered of any importance. Sugar in the form of sweets, sweetened rice, flour cakes, etc., are eaten by the youngsters in large quantities and are blamed for decayed and stained teeth which are called “chiao yah,” 焦 牙 . literally, scorched teeth. The almost universal custom is that children are given daily spending money in proportion to the size of the family pocket-book, and this is usually spent on sweets. From what I have seen I have been led to draw the conclusion that the larger proportion of the people have very irregular teeth, due, I should say, to the early loss of the temporary teeth.

A few of the dental conditions incident to the habits and food of the people are worthy of some attention. It is quite a common sight to find a V-shaped depression on the cutting edge of the right incisor, which has been formed by the constant cracking of melon and squash seeds, which are eaten in the teashops, in the homes, and

in fact anywhere that there are two or three people gathered together in idle conversation. A very prevalent injury to the molars is that of splitting. The rice eaten here is not the polished rice of America, nor is it free from all grit, and in some parts of the country there are small particles of silica of the same coloring as the rice, which are liable to be bitten on unexpectedly and split the tooth, or the shock may bring about the death of the pulp. This latter is another condition which is very common. A further cause of great annoyance and of loss of teeth is the wearing down of the contact points with the subsequent packing of food between the teeth entailing decay, gingivitis and pyorrhoea. The Chinese suppose the packing between the teeth to be brought about by the eating of too many vegetables fried in hot oil. The hot vegetable is supposed to cause the teeth to separate.

Let me bring to an end this rambling paper with a few commonplace myths and old women's sayings regarding the teeth. The older generation, and more especially those who believe in Buddhism and idols, still save their teeth which fall out and have them buried with them in order that they may present themselves before the gods with a full complement about them if not in them. Should a person enter the next world in a partial or fully edentulous state, and without being able to produce them, he might, on his transmigration, be compelled to enter his future existence as one of the lower animals who require few or no teeth. Further, Confucius says that a man would be unfilial, if, when presented by his parents with a complete body, he should pass to the beyond with a damaged or incomplete one.

I have been informed that a sure prevention against the loss of teeth through pyorrhoea and similar affections is to burn the first tooth which falls out, grind it up fine, mix it in water and drink it.

Infants' mouths are not swabbed and cleaned after feeding, and in consequence there is a great deal of aphthous—stomatitis. The superficial ulcers are called 馬牙. "ma yah", horse teeth, because the ulcers simulate the eruption of teeth and come early as do the horses'. The remedy used for the disease is the insect which is found under boards (which have laid on the ground for some time) and which are crushed and applied as a paste.

Children, when their upper deciduous teeth fall out, bury them in the ground or throw them down a well to induce their upper permanent ones to hurry down. Likewise in the case of the lower deciduous teeth, they are thrown on to the roof to attract upward the lower permanent teeth.

A woman with child, will not eat rabbit meat for the indulgence in it is supposed to cause harelip.

Children, whose anterior permanent teeth are erupting, will not eat the ever-acceptable melon and squash seeds, because the cracking of the shell causes protruding upper incisors.

Any child's teeth rubbed by a bride on her wedding day will show great speed in their growth.

If a baby's upper centrals erupt before his lowers, it is a bad sign. These teeth are called 掘士牙, "dig his grave teeth," meaning that he will likely soon die.

Missionary Dentists in the Orient

JOHN E. THOMPSON, D.D.S., CHENG TU.

SOME day I hope to write you a history of dentistry in China, but at present I wish to say that when we went to Chengtu, West China—about 2,000 miles inland—we found practically no dentistry being practised. One man was doing some prosthetic work in a crude kind of way. He practised it as a secret and when he died his art died with him.

In the fall of 1907 Dr. Lindsay went to West China under the Canadian Methodist Mission and I went in 1909. This fall I return for a second term and will take Dr. H. J. Mullett with me. We are so busy we are especially glad to have a fine young fellow like Dr. Mullett to come out and help us. He has been very highly recommended.

Our aim is to start the dental profession in West China under Christian Missionary influence. We are not merely satisfied to train dentists but to train good dentists. We have to be our own specialists in every department, not only to teach these students, but to do our own work for the Chinese and to establish a good reputation for the dental department of the mission.

We have built one house and need two more immediately. We have also built a small hospital of seven rooms. Two of these rooms are waiting rooms as the Chinese men and women do not mix. Even in church we have two entrances and a partition down the middle of the church. Our hospital is capable of extending upward, and it is on the second floor where we hope soon to have an infirmary. We have seven students and these are about ready for experience in operating. They have proven to be more adept at picking up the prosthetic work than we expected. My eldest student has put in about three years in medical college and is doing his best to become proficient in English so as to be able to help me to interpret books and lectures. The building is supplied with water by the Kewani System. The coolie pumps air and water into the tank at the same time. The compressed air forces the water through the building and the house. We have planted some vines and flowers around and we can use this system to spray them and the lawn when necessary. It runs Dr. Lindsay's water engine and is useful in distilling our alcohol.

We have the permission of the mission to start a college in connection with the medical college as soon as we can get the funds to build and get an equipment. When Dr. Mullett gets the language in a couple of years we hope to be ready to do something at it. We may have to start on a small scale, but we do not want to turn out any second-class dentists. Our ambition is that our first graduates shall be efficient dentists and men of education and character. The medical profession agree to teach the medical subjects and a pharmacist agrees to teach *materia medica*, etc. If we only had the funds to go ahead we would be soon turning out some fine dentists. In the Province of Canton there are supposed to be about 250 western trained Chinese dentists. We are anxious to get started before these men allow some of their half-trained men to go to West China and thus prevent our profession from getting a good start.

We have written a number of pamphlets on "The Care of the Teeth," "Hygiene of the Mouth," etc. We have written a number of articles for one of the papers for which we had to pay. In these articles we inform the public of our pamphlets and tell them they can be had for the asking or by mail. We have given lectures in the Y.M.C.A. and in the schools.

By this means we reach the better class of people, the students and officials. We have worked for the highest officials in West China. These patients pay a good fee and are sometimes influenced to give considerable money to missions. This class the missionaries have found very hard to reach and because we reach them we are proud of dentistry as a missionary enterprise. The Chinese pay us a consultation fee and also pay in advance. They usually make good patients.

We have started an electric plant in the press just opposite the dental compound. One of Dr. Lindsay's friends is sending him an electric engine. Some of my friends are giving me one, too, and a lathe and a fan. Mr. Fenner, of the X-ray department in the Toronto General Hospital and some of the young people of the church are giving me an X-ray plant. For some strange reason this did not appeal to the dentists very strongly, so I am particularly glad to get it from another source when I had about given up hope. You see we are gradually getting a good equipment. I have influenced a few men to support one of our students. It only costs from \$30 to \$50 per year. We like to get students from our mission school rather than from the government's schools, not only because they are better grounded, but because they understand our missionary ideals. These boys are usually poor and need at least partial support from us. It is a good investment in life,—not stocks. If any reader of this article wishes to help us in this way just send the money to Mr. J. N. Shannon, Methodist Mission Rooms, Wesley Building, Toronto.

Roentgenographic and Microscopic Studies of Tissues Involved in Chronic Mouth Infections*

ARTHUR D. BLACK, A.M., M.D., D.D.S., CHICAGO.

THE idea that mouth infections often cause serious secondary effects has, in recent years, become definitely crystallized in the minds of physician, dentist and layman. Clinical observation has been supported by careful laboratory investigations. It is now generally recognized that a chronic suppurating focus may lead to any one of a considerable group of diseases, most of which are insidious in their development and extremely chronic in their progress. The chronic focus is therefore properly considered a menace to health, and its removal is demanded. The dental profession is thus confronted with a most serious problem, so serious that the practice of dentistry must be to a considerable extent revolutionized for its solution. The chain of causes and symptoms leading up to these mouth lesions and the peculiar physiologic relationships between the tissues involved present complex problems which have been but partially solved. There are, however, certain outstanding features, the clear recognition of which should form a basis for future study.

The normal person should have thirty-two teeth. At 21 years of age the average number of teeth is about thirty; at 60 years this number has been reduced to possibly ten on the average, many having lost all. With few exceptions the loss has been the result of chronic infection, either alveolar abscess or chronic pericementitis. On the average, each person loses a tooth every year and a half or two years, the number increasing with advancing years, each tooth having been a source of chronic infection for from one to five or ten or fifteen years, so that a large percentage of persons are not free from infection involving the maxillary bones from 20 years of age until death, or until all the teeth are lost. It is safe to say that fully 50 per cent. of persons 25 years old have infections which have destroyed areas of the bone about the teeth sufficient to be easily detected by roentgenascopy, and that this percentage gradually increases until it closely approaches 100 per cent. in persons who are not edentulous at 50 years of age. The estimate made several years ago by Dr. T. L. Gilmer that 75 per cent. of adults would be shown to have chronic infections involving the maxillary bones is fully supported by statistics thus far gathered.

It would seem desirable to establish the element of danger to health which these infections represent. It is not possible at this time, however, to express in figures the relationship existing between these

*Chairman's address, read before the Section on Stomatology at the Sixty-gth Annual Session of the American Medical Association, New York, June, 7, and published in the Journal of the A. M. A., August 25th, 1917.

mouth foci and the systemic effects, because the same systemic effects may result from such a variety of sources. Mouth infections might be considered as casual in proportion of their percentage of occurrence to other original foci, although the defense of the various tissues attacked would doubtless modify such a calculation. It is certainly illogical to conclude that a particular systemic effect is due to a mouth focus unless all other sources have been eliminated. Without question, in many cases, several sources are acting simultaneously.

Apparently the resistance of a large percentage of persons is sufficient to give full protection for years, yet we must ever keep in mind the insidious development of the secondary effects and then ask ourselves if we can be even reasonably certain that one's health is safeguarded so long as there is definite evidence of infection in the mouth.

There are two points of initial attack and two entirely separate routes of progress by which chronic mouth foci become established. The chronic lesions themselves, however, have many characteristics in common. The one begins with dental caries, as a result of which the pulp of the tooth becomes involved directly or indirectly and an inflammation of the periapical tissues is established. The other begins as a gingivitis and progresses alongside the root toward the apex, involving the peridental tissues. In both, the destructive processes include the peridental membrane, the bone of the alveolar process and the cementum covering the root of the tooth.

In view of the high prevalence of both forms of these lesions in adults, and of their extreme chronicity and intractability to treatment, to which reference will be made later, our hope for the future lies principally in prevention, and it is this which calls for radical changes in dental practice. Dental caries must be prevented or so treated that there will be the highest possible degree of pulp conservation. This means broader education of the public, and especially of children, to the need and means of better care by themselves, as well as more frequent and regular observation and treatment by the dentist. The dentist must follow more scientific lines in all operations better to control caries, and so to prepare and fill cavities that the pulps will remain vital. Gingival irritation must be reduced by better cleanliness by the patient and there must be improvement of technic in both operative and prosthetic procedures by the dentist so that there will be no irritation, either by margins of fillings, crowns, etc., or by food impaction as a result of faulty forms or tooth contacts. While these are simple statements which are readily accepted by all, their adoption in practice can come about only as a result of a fuller appreciation by dentists generally of the pathologic problems involved, both at the original foci and in the remote after-effects.

The changes which take place in the peridental tissues, as inflammatory processes progress to the establishment of chronic foci, represent the normal reaction to chronic irritation accompanied by inf

tion, plus certain changes in the specialized elements of these tissues. Noyes (1) has recently shown that the principal route of travel of the infections beginning in the gingivae is by way of the perivascular lymphatics. He called attention to the fact that, in cases of gingival irritation caused by deposits of salivary calculus, the vessels of the gum tissue are followed and the destruction of the bone of the alveolar process is from the gum side. This explains the previous clinical observation of Black (2) that deposits of salivary calculus do not, as a rule, cause the formation of pockets alongside the roots of the teeth.

In cases of chronic pericementitis, the blood vessels which lie within the peridental membrane are followed. As the course of these vessels is mainly in the direction parallel to the long axis of the tooth, we have an explanation of the more rapid progress of these infections toward the apex, as compared with their progress laterally around the root, resulting in deep, narrow pockets. The fact that chronic alveolar abscesses do not cause a similar destruction of the peridental membrane in the opposite direction is also explained, as the movement of the lymph is from the gingivae apically.

Many specimens (3) of the tissues overlying these pockets, some including the teeth and all of the surrounding structures, studied in the research laboratory of Northwestern University Dental School during the past five years, show the changes which have been described by Talbot, Noyes and others. These include the thickening of the walls of the vessels to the point of obliteration, with the gradual disintegration of the surrounding tissues until apparently necrotic areas are formed, the tissue taking the ordinary stains poorly or not at all. These areas involve both the soft tissue and the alveolar process. Eventually the peridental membrane seems to be severed for a space, leaving a portion attached to the cementum of the root and a portion attached to the alveolar process. Areas of absorption of the cementum appear in many specimens; these apparently occur early, as a response to the irritation caused by the approaching destructive process. Later the tissue remaining attached to the cementum dies and disappears, leaving the cementum entirely denuded. The cement corpuscles also die, and the cementum becomes a necrosed, pus-soaked tissue.

The peridental fibres attached to the bone are similarly destroyed, and the bone is also invaded, areas being hollowed out along the lines of the vessels. Black (4) called attention to the fact that we might expect the fibres of the peridental membrane and the alveolar process to disappear, as a purely physiologic process of absorption,

(1) Noyes, F. B.: Studies of the Pathology of the Peridental Membrane, Jour. National Dental Assn., April, 1917, p. 375.

(2) Black, G. V.: Special Dental Pathology, p. 100.

(3) Specimens prepared during the past year by E. H. Hatton, M.D., research investigator, Northwestern University Dental School.

following the severance of the membrane from the cementum, regardless of the continued progress of the pathologic invasion. Doubtless both processes are factors in most cases.

The role which the gingival epithelium plays in these cases is extremely interesting. Many specimens show extensive projections deep into the submucous tissues and into the bone itself. Cross sections of these projections frequently show the cells in concentric rings, suggesting epithelioma. A growth of epithelium down into the pocket is frequent, apparently an attempt to line the pocket and protect the connective tissue. We have also noted, in cases in which the overlying tissue is cut away, exposing the denuded root, that the epithelium of the gum tissue will not only cover the cut surface, but also grow down to the line of attachment to the cementum, thus forming a new gingiva.

Practically the same changes take place in chronic alveolar abscess, except that the progress along the surface of the root is slower, is more likely to include the entire circumference, and a cavity is formed in the bone corresponding to the area of detachment of the cementum. The bacteriology of these cases has been studied by Gilmer (5) and reported in several papers. The bacteriology of the pus pocket is more complex, and will probably never reveal a specific organism. The paper read before this section last year by Lescohier (6) gives practically all available information.

As has been pointed out prominently before, the denuded cementum is the factor of prime importance in maintaining the chronicity in both groups of cases. A pus-soaked tissue, analogous to necrosed bone, except that it cannot be exfoliated it defies reattachment of the adjacent tissue and remains as a continuous irritant. The prompt healing of these areas following the extraction of the teeth is sharp evidence of the role which the cementum plays. While the invasion of the surrounding soft tissues by infection is of the greatest importance in considering these areas as a menace to health, it is of very little consequence so far as healing is concerned. The infection is quickly eliminated by the tissues when the irritant—the cementum—is removed.

During the past year I have had roentgenograms made of all the teeth and adjacent bone for about 400 persons, for the special purpose of determining the frequency and extent of the infections of the maxillary bones. It was realized that most roentgenograms are taken because of the definite indication; consequently they do not represent average conditions. In order that these might represent as nearly

(4) Black, G. V.: *Special Dental Pathology*, p. 168.

(5) Gilmer, T. L.: *Chronic Oral Infections*, *Arch. Int. Med.*, April, 1912, p. 499. Gilmer, T. L., and Moody, A. M.: *A Study of the Bacteriology of Alveolar Abscess and Infected Root Canals*, *The Journal A. M. A.*, Dec. 5, 1914, p. 2023; *Oral Health*, February, 1916.

(6) Lescohier, A. W.: *The Bacterial Findings and Their Relationship to Pyorrhoea Alveolaris and Interstitial Gingivitis*, *The Journal A. M. A.*, Feb. 10, 1917, p. 414.

average conditions as possible, the persons were selected from several sources, and most of them without previous inquiry as to mouth conditions or general health. About 175 are of the mouths of members of the senior class at Northwestern University Dental School, a few were patients of the school, a few were patients of other dentists, a few were selected from the files of Dr. Leach, who did the roentgenographic work, and a limited number were my patients.

For persons under 40 years of age, the figures presented probably represent very nearly average conditions. We were able to select from these roentgenograms a group of thirty full mouth examinations for persons, most of whom had the full complement of thirty-two teeth, which show no infection whatever of the maxillary bones, and not one of these thirty persons had had a single pulp of a tooth removed. The 300 films of this group are mounted on a single sheet of celluloid and make an interesting study.

For persons over 40 years of age we were not so fortunate in securing a large majority who did not present evidence of infection before the roentgenograms were ordered. Therefore they show a percentage of infection above the average.

The accompanying table was made from 3,000 roentgenographic films of the teeth and adjacent bone of the mouths of 300 adults. (7). In each case ten small films were made. The tabulation includes the age, systemic symptoms, number of teeth, disease of the peridental membrane as indicated by destruction of bone alongside the roots, alveolar abscess as indicated by destruction of bone at the apexes of roots, the number of teeth having good or poor root canal fillings with the number of abscesses in relation to each group, and the number of teeth without root fillings which were abscessed.

In order to secure as accurate information as possible as to systemic effects, it being impracticable to have a thorough physical examination in these cases, a questionnaire was prepared as follows: 1. Are any of the finger joints enlarged? 2. Has the patient noticed enlargement of other joints? 3. Have other joints or muscles been painful? 4. Is the patient anemic? 5. Is there inflammation of eyes, or impairment of vision, other than astigmatism? 6. Is there inflammation of nose, throat or tonsils? 7. Have there been attacks of appendicitis, ulcers of stomach, cholecystitis or other systemic conditions which might result from focal infection? 8. Does the patient complain of unusual nervousness or fatigue? On reviewing the answers the patient was entered as (1) negative, or (2) presenting occasional muscular, joint or similar symptoms, or (3) as having a well defined case of arthritis, nephritis, appendicitis, etc.

Through a misunderstanding on the part of one of my assistants, this report of systemic symptoms was not secured for sixty-eight persons included in the tabulation. It is realized that 300 cases would not have been sufficient to establish reliable data as to the relation-

ship of these foci to systemic effects, and it is my intention to continue this study until several thousand persons shall have been examined. The statistics gathered so far are considered as forming a good basis for this work. It may be said now, however, that of those for whom histories were secured, there is a decided increase with advancing years which follows closely the percentage increase of mouth infections.

The average number of teeth per person is interesting. The tabulation shows thirty teeth per person under 25 years, twenty-nine per person of 25 to 30 years, twenty-six per person of 30 to 40 years, and twenty-five per person of 40 to 50 years, and twenty-three per person over 50 years.

Destruction of bone about the sides of roots of teeth as a result of infections beginning in the gingivae is shown to increase very markedly after the twenty-fifth year, there being 9 per cent. of persons below 25 years having these pockets, and 32 per cent. for the ages from 25 to 30 years. For the succeeding decades the percentage increases to 64, 74 and 92. The number of pockets per mouth also shows considerable increase with age.

Fifty-two per cent. of persons under 25 years have chronic alveolar abscess, a much greater percentage than that of pus pockets alongside the roots in the same group. The abscess percentages do not increase as rapidly as the cases of chronic pericementitis, being 53 per cent. for persons from 25 to 30 years, 66 per cent. for persons from 30 to 40 years, 68 per cent. for persons from 40 to 50 years, and only 55 per cent. for persons over 50 years. The smaller number for those over 50 years is evidently because of extractions.

A summary of those having either peridental infections beginning at the gingivae or periapical infections, or both—persons who have infections involving the maxillary bones—gives rather astonishing results. The percentage is 56 for persons under 25 years of age, 72 for those between 25 and 30 years, 87 for those between 30 and 40 years, 89 for those between 40 and 50 years, and 100 per cent. for those over 50 years.

The youngest person in the tabulation was aged 17 years, and there were but nine out of the eighty-nine in the group under 25 years of age who were under 21, so that the figures for this group might be considered as from 20 to 25. While no tabulation has been made for children, I think I am safe in stating that practically no infection of the peridental membrane beginning in the gingivae will be found, and comparatively few chronic alveolar abscesses. Therefore, attention may be called to the fact that the tonsils are much more likely to be the seat of original foci in children.

Attention is again called to the fact that the figures for persons beyond 40 years are too high as average figures, especially for peridental infections, because the roentgenograms for many of these, and

especially for persons over 50 years, were taken because the patients presented themselves for consultation.

The tabulation of abscesses in relation to root fillings should be of special interest to dentists. The remark has often been made that roentgenograms show many teeth with imperfect root fillings which are not abscessed, and such observations have doubtless supported continued carelessness in the technic of treating and filling root canals. For this study, the teeth are divided into two groups, those having large root canals, and those having small canals. The root fillings were classified as good or poor. A root filling was classed as good if it extended to or close to the end of the root, and if the filling apparently filled the apical portion of the canal. For some small canals, if the filling did not reach the root apex by 3 or 4 mm. and the canal could not be made out in the roentgenogram beyond this point, the root filling was classed as good. I do not advocate this plan of treating small canals, but wish to impress the fact that I was liberal in classifying root canal fillings as good.

Of the teeth with root fillings in large canals classed as good, but thirteen out of 178 were abscessed; in small canals, but ten out of ninety-five. This is 8 per cent. Of those in large canals classed as poor, 225 out of 338 were abscessed, in small canals 154 out of 242. This is 65 per cent. Could there be presented a better argument, a more imperative demand, for more careful technic in the treatment of root canals?

CONCLUSION.

These suppurative detachments of the peridental membrane are in practically all cases permanent detachments, whether the detachment is at the side of the root or the apex. The area of bone destroyed about the apex of a root is not so important as the extent of the destruction of the peridental membrane. There is no hope of reattachment of the surrounding tissue to the root, and if such teeth are permitted to remain in the mouth—excepting those which are operated on by resection—it should be with the definite understanding that they necessarily continue as a menace to the health of the individual, and that the use of such teeth in mastication overbalances this menace to the health. In such cases we are using our best judgment as to the patient's general physical condition and his resistance. We must do this with the thought ever in mind that nephritis, endocarditis, cholecystitis and other secondary effects are so insidious in their onset that the condition is likely to be serious and the patient even beyond the possibility of recovery before it is discovered by the physician.

ABSTRACT OF DISCUSSION.

DR. THOMAS L. GILMER, CHICAGO: To offset the great harm that is being done by infectious mouth foci, our methods of practice must be changed. I have no doubt, as the essayist has said, that

mouth foci are blamed for many things for which they are not responsible. There are some dentists and not a few practitioners of medicine who are doubtless going too far in the wholesale removal of teeth. The physicians with whom I have been associated endeavor to eliminate all foci of infection, including the teeth, from all parts of the body. They realize that there are many other parts of the body beside the jaws which may be a cause of metastases. Pyorrhoea specialists should take up the subject of pyorrhoea in somewhat the same exhaustive way as has been done by Drs. Black and Noyes to determine what its pathology is. Then they may be able to offer rational treatment which will bring about a cure. No one should call himself a specialist unless he does this. Dentists have tremendous problems before them which will take the wisest and best among them to solve. I trust that they will go to work at once to discover the cause and cure of some of the more serious diseases of the mouth.

DR. G. ALDEN MILLS, NEW YORK: Dr. Black's analysis and research in this matter take me back to 1876 when I wrote the first articles that were published on this subject of Riggs' disease, except one by Dr. Riggs, and by these articles were initiated the studies on pyorrhoea. I studied in sympathy as a student of Dr. Riggs. I had the value of his acquaintance and the value of his treatment on my teeth, and though 86 years old, I am happy to say that I have a good many teeth left. Dr. Smith of Philadelphia has forced on the profession the question of prophylactic treatment. So we have now to say that prophylactic treatment is of immense help in the treatment of this disease.

DR. E. P. R. RYAN, NEW YORK: The greatest thing about Dr. Black's paper is the information he has given us of the cases he has reported that are not, and cannot be blamed for systemic infection. Men working every day need some standardization of examination of the roentgenograms that are made. We all have an isolated case here and there that we lay to some systemic condition of the mouth; but what the man in practice wants to know for making a rational diagnosis is, What is the percentage of those cases? We can extract all the teeth in the mouth, but that is not good dentistry, and that is not going to cure the disease. I think the suggestion of the examination of the normal teeth as well as those diseased, and determination of the relative percentages, should be accepted, and some means devised whereby we can all make observations and report them, and arrive at some definite and precise conclusion.

DR. ARTHUR ZENTLER, NEW YORK: As the paper of Dr. Black deals with the pathologic study of the tissues involved in infections of the mouth, I feel that it may be appropriate to report the divers findings in the examination of sections obtained in operating for eradication of such oral infections.

The picture seen in the photomicrographs prepared from pathologic laboratory slides is different when obtained from mouths of patients suffering from different types of general disturbance; for instance, arthritis, cardiac lesions; infection due to external trauma (a blow on the chin), which is relatively of acute character, apparently causing no general disturbance; still different when the infection is due to operative trauma, the infection being of long standing and in a patient of a special diathesis; for instance, tuberculous.

[The discussion was illustrated by lantern slides.]

DR. ARTHUR D. BLACK, CHICAGO: Among the films exhibited, there is a set of roentgenograms of the mouth of a patient who was under the care of a so-called pyorrhoëa specialist. The radiographs show that the alveolar process has been destroyed nearly to the ends of the roots of the upper bicuspid and molars, and these teeth are apparently being held in place by orthodontia appliances while they are scaled and treated. This case illustrates what I meant when I said the practice of dentistry needs to be revolutionized. Here is a mouth in which it is evident to any one who has studied the problem of focal infections that the teeth should be extracted. There must be developed in the dental profession a sense of recognition of mouth infections before we can make real progress with this subject. The dental profession must recognize that such foci are a menace to health; then it will not be difficult to get action. The more I study these conditions the more I am convinced that more teeth must be extracted.

Preliminary Program, Twenty-first Annual Session of the National Dental Association

TO BE HELD IN NEW YORK CITY OCT. 22, 23, 24, 25, 26, 1917
AT HOTEL ASTOR.

FIRST GENERAL SESSION TUESDAY, OCTOBER 23RD, 9 A.M.

Address of Welcome.

Gov. Charles S. Whitman, on behalf of State . . . Albany, N.Y.

Mayor John P. Mitchell, on behalf of City . . . New York City

Response to Address of Welcome.

Henry W. Morgan Nashville, Tenn.

President's Address.

LaFayette L. Barber Toledo, Ohio

Oration.

E. C. Rosenow (M. D.) Rochester, Minn.

A research member of the Memorial Institute for Infectious Diseases, Chicago, and Professor of Experimental Bacteriology in the University of Minnesota and the Mayo Institute.

SECOND GENERAL SESSION, TUESDAY, OCTOBER 23RD, 8 P.M.

Research Department—Reports of Special Researches.

Pathological, Bacteriological and Clinical Studies.

"Dental Caries." By Russell W. Bunting and U. G. Rickert (B. S., M. A.). Work done in, and with the assistance of, the University of Michigan.

"A Study of the Pathology of the Peridental Membrane." By Frederick B. Noyes. Work done in, and with the assistance of, the University of Illinois.

"The Histopathology of Chronic Periodontitis and the Pathogenesis of Dental Root Cysts." By Thomas B. Hartzell and Arthur T. Henrici, (M. D.). Work done in, and with the assistance of, the University of Minnesota.

"A Comparative Study of Oral Focal Infections." By Weston A. Price and Milton J. Damlos. Research Institute Laboratories, Cleveland, Ohio.

THIRD GENERAL SESSION, WEDNESDAY, OCTOBER 24TH, 8 P.M.

Herbert L. Wheeler, Chairman New York City
Dental Surgery and Restorative Prosthesis in the European War.

Symposium—"Dental Surgery and Restorative Prosthesis in the European War."

"War Dental Surgery." By

"War Dental Restorative Prosthesis." By

It is expected that Mr. Robert Bacon, Ex-Embassador to France, will preside, and that the Surgeons General of both the Army and Navy will attend. A description of the work done in Europe will be given by one who has had experience there. It is anticipated that both the Medical and Dental Professions will be represented. There will also be pictures of "War Surgery."

FOURTH GENERAL SESSION, THURSDAY, OCTOBER 25TH, 8 P.M.

Oral and Dental Hygiene—Mass Meeting.

Charles H. Oakman, Chairman Detroit, Mich.

"Address" By Governor Martin G. Brombeau Penn.

"Oration." By Charles Mayo Rochester, Minn.

"Oration." By E. C. Rosenow, Univ. of Minn., Minneapolis, Minn.

"The Importance of Dental Infections as Related to Urinary Tract Diseases, with Particular Reference to Ureter Stricture and its Sequelae." Guy L. Hunner (S. B., M. D.) Johns Hopkins University, Baltimore, Md.

Discussed by Wm. H. G. Logan, Chicago, Ill., and A. I. Folsom, (M. D.), Dallas, Texas.

SECTION PROGRAM.

SECTION I.—TUESDAY, OCTOBER 23RD, 1:30 P.M.

Operative Dentistry, Nomenclature, Literature, Dental Education and Allied Subjects.

"Present Day Tendencies in Operative Dentistry." By J. M. Wall. St. Paul, Minn.

Discussed by A. H. Hippel, Omaha, Neb.; A. R. Starr, New York N. Y., and B. B. McCollum, Los Angeles, California.

"The Porcelain Inlay; Its Strength and Durability." By W. L. Fickes, Pittsburgh, Pa.

Discussed by A. L. LeGro, Detroit, Mich.; C. K. Buell, Buffalo, N. Y., and W. A. Capon, Philadelphia, Penn.

WEDNESDAY, OCTOBER 24TH, 1:30 P.M.

"Some Neglected Operative Perquisites." By Fred E. Hart, San Francisco, California.

Discussed by D. P. Towner, Memphis, Tenn.; F. W. Gethro, Chicago, Ill., and C. O. Simpson, St. Louis, Mo.

"The Part of American Dentistry in the War Situation." By H. E. Friesell, Pittsburgh, Pa.

Discussed by Herbert L. Wheeler, New York.

SECTION II.—WEDNESDAY, OCTOBER 24TH, 9 A.M.

Oral Surgery, Anatomy, Physiology, Histology, Pathology, Etiology, Prophylaxis, Oral Hygiene, Materia Medica and Allied Subjects.

"The Explanation of Certain Misleading Things We See in Dental Radiographs." By Howard R. Raper, Indianapolis, Ind.

Discussed by F. D. Miller, Altoona, Pa., and Clarence O. Simpson, St. Louis, Mo.

"Is Over-filling Root Canals a Safe Procedure?" By Elmer S. Best, Minneapolis, Minn.

Discussed by Fred W. Gethro, Chicago, Ill., and Meyer L. Rhein, New York City.

THURSDAY, OCTOBER 25TH, 9 A.M.

"Reconstructive Bone Surgery." By Morris I. Schamberg, New York City.

"The Action of Emetin on the White Blood Cells." (Preliminary Report). By Benjamin H. Schlomoritz, Chicago, Ill.

SECTION III.—TUESDAY, OCTOBER 23RD, 1:30 P.M.

Prosthodontia, Orthodontia, Metallurgy, Chemistry and Allied Subjects.

"The Chemical Action of Soil Bacteria on Calcium Phosphates with the Chemical Analysis of the Human Teeth." By J. E. Hinkins, Chicago, Ill.

"Why Measurements of the Mandible, Tracings of the Condyles, the Construction of Hypothetical Triangles, and the use of the Face Bow are all non-Essential in the Construction of Dentures Possessing the Highest Degree of Efficiency." By Dayton Dunbar Campbell, Kansas City, Mo.

Discussed by George W. Clapp, New York City, and Martin Dewey, Chicago, Ill.

WEDNESDAY, OCTOBER 24TH, 1:30 P.M.

"Oral Hygiene with Special Reference to Ionic Chemistry." By George F. Fette, Cincinnati, Ohio.

Discussed by Hermann Prinz, Philadelphia, Pa.; Meyer L. Rhein, New York City, and C. T. Van Woert, Brooklyn, N. Y.

"A New Continuous Gum Set." By Frederick H. Nies, Brooklyn, N. Y.

Discussed by L. E. Custer, Dayton, Ohio, and John F. Stephan, Cleveland, Ohio.

"Orthodontia." (?) By Calvin S. Case, Chicago, Ill.

STATE SOCIETY OFFICERS' SECTION.

WEDNESDAY, OCTOBER 24TH, 9 A.M.

"Post Graduate Course." By B. L. Shobe, Tulsa, Oklahoma.

Discussed by Benjamin Sandy, Minneapolis, Minn.

"Taking an Invoice of Our State Societies." By Otto U. King, Huntington, Ind.

Discussed by C. R. Lawrence, Enid, Oklahoma.

WEDNESDAY, OCTOBER 24TH, 1:30 P.M.

Symposium.

"Method Used in Handling the Mid-Winter Dental Clinic, Atlanta Dental Society." By Thomas P. Hinman, Atlanta, Ga.

"Organization." By J. P. Luthringer, Peoria, Ill.

"Oral Hygiene in the Industries." By Thaddeus P. Hyatt, New York City.

"State Legislation from a Dental Standpoint." By A. H. Reynolds, Philadelphia, Pa.

"A General Manager for a Dental Convention as Adopted by the New Jersey State Dental Society." By William H. Gelston, Camden, N. J.

"Simplified Methods of the State Secretary in Expediting the Business of the State Society." By A. P. Burkhart, Auburn, N. Y.

"The Relation Component Societies Should Bear to State and National Organizations." By S. P. Cameron, Philadelphia, Pa.

RESEARCH DEPARTMENT.

WEDNESDAY, OCTOBER 24TH, 9 A.M.

Reports of Special Researches.

"Root Canal Fillings." By John R. Callahan. Work done in, and with the assistance of, the Cincinnati General Hospital.

"Studies Upon the Bacteriology of Dental Caries." By Percy R. Howe. Work done in, and with the assistance of, the Forsyth Dental Infirmary.

"Quantitative Determinations of Certain Organic Substances in Saliva and Their Relation to Oral Conditions." By John A. Marshall, (M. S.). Work done in, and with the assistance of, the University of California.

"Electrolytic Medication—Physiological and Dental Aspects." By Samuel E. Pond, (B.H., A.M.) and Weston A. Price, Research Institute Laboratories, Cleveland, Ohio.

THURSDAY, OCTOBER 25TH, 9 A.M.

Chemical and Metallurgical Studies.

"Dental Cements." By Marcus L. Ward. Work done in, and with the assistance of, the University of Michigan.

"Progress of the Investigation of Mottled Enamel." By Frederick S. McKay, Colorado Springs, Colo.

"Studies of Internal Secretions in Their Relation to the Development and Condition of the Teeth." By William J. Gies, (M.D., Ph.D.). Work done in, and with the assistance of, the Columbia University.

"The Relative Efficiency of Medicaments for the Sterilizing of Tooth Structures." By Matilda Moldenhauer (A.B., M.S.) and Weston A. Price, Research Institute Laboratories, Cleveland, Ohio.

ORAL AND DENTAL HYGIENE.

WEDNESDAY, OCTOBER 24TH, 9 A.M.

"Oral Hygiene." By L. G. Mitchell, Oklahoma City, Oklahoma. Discussed by B. S. Hert, Rochester, N. Y., and George F. Burke, Detroit, Mich.

"Lantern Slide Talk Showing Results of Neglected Oral Hygiene." By C. H. Oakman, Detroit, Mich.

Discussed by Truman W. Brophy, Chicago, Ill.; Thomas P. Hinman, Atlanta, Ga., and John D. Patterson, Kansas City, Mo.

Educational Exhibits.

Sidney J. Rauh, Cincinnati, Ohio, will show a series of large models, size: 18 inches, 24 inches deep and 8 inches high. These models are colored, and one series depicts the progressive stages of decay; the other, results of neglect from lack of or improper brushing. A series of panels shows the results caused by neglected decay from the small cavity abscess condition and then the treatment of same. There are several other models, pictures, etc., all to be used in educating the public as to the importance of Mouth Hygiene.

WEDNESDAY, OCTOBER 24TH, 1:30 P.M.

"_____." By Alfred C. Fones, Bridgeport, Conn. Discussed by Lewis E. Ford, Los Angeles, Cal.; E. B. Spalding, Detroit, Mich., and Frederic R. Henshaw, Indianapolis, Ind.

THURSDAY, OCTOBER 25TH, 9 A.M.

"_____." By Harold DeW. Cross, Boston, Mass. Discussed by Harvey J. Burkhart, Rochester, N. Y.; Nelville S. Hoff, Ann Arbor, Mich., and John F. Stephan, Cleveland, O.

"Dental Publicity." By H. C. McKittrick, Indianapolis, Ind. Discussed by C. O. Simpson, St. Louis, Mo.; Sidney J. Rauh, Cincinnati, Ohio, and Howard R. Raper, Indianapolis, Ind.

PREPAREDNESS LEAGUE OF AMERICAN DENTISTS

TUESDAY, OCTOBER 23RD, 1:30 P.M.

"The Relations of the Dental to the Medical Corps of the Army."

By Victor C. Vaughan, (M.D.) Ex-President of the American Medical Association, Member General Medical Board of the Council of National Defence, Washington, D. C.

"The Value of the Educational Work as Being Executed by the Preparedness League of American Dentists." By Frank M. Casto, Cleveland, Ohio.

"Report of Sectional Units of League by States—A to N inclusive."

WEDNESDAY, OCTOBER 24TH, 1:30 P.M.

"Stereopticon Lecture on Fractures of the Bones of the Face." By Truman W. Brophy, Chicago, Ill.

(Synopsis: This lecture will include the consideration and treatment of Gun Shot wounds; removing foreign substances; the sterilization of wounds: the proper adjustment of fragments and the means employed to mobilize them. In the treatment of injuries of the face, the primary step should be after removing foreign substances, to establish as nearly as possible, asepsis. The use of grafts of bone, modeling compound, hard rubber and metals to replace lost parts.)

"The Dental Ambulance in War." By George B. Hayes, Neuilly, (Paris) France.

"Report of Sectional Units by States—M to Z inclusive."

(An interesting Preparedness Exhibit will be shown, including Dental Ambulances, Base Hospital, Field Hospital and First Aid Equipments; in fact, everything relative to the service of the Dental Reserve Corps, and Red Cross. Officers will be present to give instruction and information. The ambulances shown will be sent to France as the gift of members of the Preparedness League and appreciative patients.)

ANESTHETISTS SECTION.

WEDNESDAY, OCTOBER 24TH, 1:30 P.M.

"The Teaching of Local Anesthesia." By Theo. Blum, New York City. Discussed by Hugh W. MacMillan, Cincinnati, Ohio, and Robert H. Ivy, Milwaukee, Wis.

"The Relative Toxicity of Local Anesthetics." By George B. Roth, Washington, D. C. Discussed by J. E. Engstad, Minneapolis, Minn., and J. E. Nyman, Chicago, Ill.

"Cause of Failure and Dentoward Sequelae in Conductive Anesthesia." By Richard H. Riethmueller, Montclair, N.J. (Illustrated by Moving Picture Film.)

THURSDAY, OCTOBER 25TH, 9 A.M.

"After-pain in Local and General Anesthesia." By A. E. Hertzler, Kansas City. Discussed by Leo Stern, New York City; Don M. Graham, Detroit, Mich., and Wm. J. Lederer, New York City.

"General Anesthesia for Oral Surgery." By Herbert A. Potts, Chicago, Ill. Discussed by Truman W. Brophy, Chicago, Ill.

Morris L. Schamberg, New York City, and Wm. L. Shearer, Omaha, Nebraska.

PROPHYLAXIS AND PERIODONTOLOGY PROGRAM

WEDNESDAY, OCTOBER 24TH, 9 A.M.

The American Academy of Oral Prophylaxis and Periodontology.

"Chemical Factors in Oral Immunity." By William J. Gies, New York City.

"A Consideration of the Physiology of the Mouth Tissues in Treating Diseases of the Same." By Hugh W. MacMillan, Cincinnati, Ohio.

"The Rational Treatment Pyorrhoea." By Arthur H. Merritt, New York City.

"Dental Periclasia, Vital Points in Treatment, with Lantern Slides Showing Regeneration of Bones." By Frank C. Pague, San Francisco, California.

CLINIC PROGRAM.

The Clinic Committee of the National Dental Association has arranged for an Illustrated Lecture Clinic, a Progressive Clinic and Surgical Clinic under Conductive and General Anesthesia.

THURSDAY, OCTOBER 25TH, 9 A.M.

Oral Surgery Clinic.

"Cleft Palate." By Chalmers J. Lyons, Ann Arbor, Mich.

"Neurectomy of Fifth Cranial Nerve." By Charles H. Oakman, Detroit, Mich.

Operations under Conductive and General Anesthesia will be held in the City Hospital before such audiences as the four operating rooms put at our disposal will accommodate. Clinicians and operations they will perform if suitable cases can be secured are as follows:

PROGRESSIVE CLINICS—CROWN AND BRIDGE WORK AND ROOT CANAL.

THURSDAY, OCTOBER 25TH, 2 P.M., AND FRIDAY, 9 A.M.

Root Canal Section—A. J. Bush, Director.

1. Carl J. Grove, St. Paul, Minn.—"Multi-Canaliculated Roots."
2. Elmer S. Best, Minneapolis, Minn.—"Root Canal Filling."
3. Geo. T. Fette, Cincinnati, Ohio.—"Electrolytic Treatment of Root Canals."
4. ————. "Clinic on Ionization."
5. Frederick E. Hart, Director, San Francisco, California.—"System in Operative Procedures."

Contribution by G. V. Black, Club of University of California, showing Charts and Models for teaching purpose in connection with club's work.

ILLUSTRATED CLINICS SECTION.

THURSDAY, OCTOBER 25TH, 2 P.M., AND FRIDAY, 9 A.M.

Nerve Blocking.

Synopsis later. By Arthur E. Smith, Chicago, Ill.

2. "Simple, yet Effective Means of Making Attachment to Vital Teeth for Removable Bridge Work and Partial Plates." By G. Walter Dittmar, Chicago, Ill.

DETROIT CLINIC CLUB—INLAY SECTION.

The Technic of the Impression and Model Method for Gold and Porcelain Crowns.

THURSDAY, OCTOBER 25TH, 2 P.M., AND FRIDAY, 9 A.M.

1. "Principles in handling the impression material. The use of the matrix." (Impressions of occlusal, buccal, cervical, and mesial-occlusal-distal cavities.)—Edward B. Spalding.
2. "Impressions of Cavities in Incisors and Cuspids."—George William King.
3. "Impressions for Porcelain Jacket Crowns and its Modifications and Accurate Articulation for Them."—Charles A. Ross.
4. "Preparation of the Impression, Investing and Packing with Amalgam."—Howard L. Jones.
5. "Mounting of Models for Contract and Occlusion."—Sigurd Becker.
6. "Principles of Cavity Preparation for Porcelain Inlays. Carving for anatomical Restoration."—Wilbert J. Whiteman.
7. "Burnishing Matrices for Porcelain Inlays."—Albert J. Hall.
8. "Building in of Foundation Body."—Edgar L. Giffen.
9. "Laying on and Blending of Colors in Enamels."—William J. Meier.

PROSTHODONTIA SECTION.

THURSDAY, OCTOBER 25TH, 2 P.M., AND FRIDAY, 9 A.M.

1. "Preliminary Impressions and Their Significance."—Frank W. Holt.
2. "Preliminary Models and Their Individual Impression Trays."—J. Longe.
3. "Test Impression Upper Dental Arch."—Charles Lane.
4. "Test Impression Lower Dental Arch."—William A. Matheson.
5. "Working Models. Try in Plates and Bite Rims."—Lloyd Rogers.
6. "Taking Bite Recording Condoye Path, and Mounting on Articulator."—Oscar Manthey.
7. "Selection of Teeth Trubyte System."—P. C. Lowery.
8. "Arrangement of Teeth to Produce Normal Balance."—Elmer L. Whitman.

THURSDAY, OCTOBER 25TH, 2 P.M., AND FRIDAY, 9 A.M.

Synopsis:—

PORCELAIN CROWN SECTION.

1. Diagnosis.
2. Prognosis.
3. Preparation.
4. Impressions.

5. Definite Models.
6. Definite Seating of Models.
7. Amalgam Models.
8. Definite Articulated Occlusion of Models.
9. Making Cement Models.
10. Making of Matrices.
11. Making of Cement-jackets.
12. Making of Synthetic Porcelain Crowns.
13. No. 40 Tin Articulation Matrices.
14. Packing of Porcelain.
15. Agitation of Mass for removal of moisture.
16. Producing shades.
17. Definite approximation.
18. Carving.
19. Definite occlusal surfaces and planes.
20. Definite finished work produced without the necessity of grinding after final bake.

CROWN AND BRIDGE SECTION.

THURSDAY, OCTOBER 25TH, 2 P.M., AND FRIDAY, 9 A.M.

1. "Showing Two Kinds of Hand Carved Porcelain Crowns."—William H. Elliott.
2. "Showing Goslee, Plate, and Dowel Crowns."—L. F. Burlingame.
3. "Showing Cast Cups and Seamless Gold Crowns."—Ira A. Lehman.
4. "Showing Two Kinds of Richmond Crowns."—John J. Travis.
5. "Showing Setting up of Bridge Parts and Investing Bridges."—H. S. Bailey.
6. "Showing Completed Fixed Bridges."—Frank C. Cole.
7. "Showing Inlay Attachments and Removable Bridges."—Marcus L. Ward.

PREVENTIVE DENTISTRY SECTION.

THURSDAY, OCTOBER 25TH, 2 P.M., AND FRIDAY, 9 A.M.

1. "Malocclusion as a Cause of Periodontal Diseases."—Charles P. Wood.
2. "Colored Models Representing Various Stages of Gingivitis."—Louise M. Pagleson.
3. "The Technic of Preventive Dentistry for Children."—M. Allen-yene.
4. "Methods of Polishing Enamel Surfaces."—Ruth S. Matheson.
5. "Preparation of Root Surfaces."—George C. Bowles.
6. "Instruction of the Patient."—Grace R. Spalding.
7. "Dentifrice."—William P. Northrup.

CLINIC PROGRAM.

FRIDAY, OCTOBER 26TH, 9 A.M.

The illustrated lecture clinics and the progressive clinic given on Thursday 2 p.m. will be repeated.

THE COMPENDIUM

This Department is Edited by
THOMAS COWLING, D.D.S., Toronto

A SYNOPSIS OF CURRENT LITERATURE RELATING
TO THE SCIENCE AND PRACTICE OF DENTISTRY

INVESTMENTS FOR DENTISTS.

ALTHOUGH a contrary opinion is commonly held, yet it is true that no class of professional men labor so hard for their livelihood as do dentists. Their hours are long and the work exacting to a degree. Whatever means they are successful in accumulating ought to be guarded with jealous care, because the period of active practice is at best a limited one. For dentists, the old adage, "make hay while the sun shines," is peculiarly applicable. Confinement in an office all day soon saps the strength of the most robust; the performance of difficult operations upon sensitive and high-strung patients will sooner or later take toll of our stock of nervous energy.

A dentist's period of professional activity is short, and he acts wisely who makes provision for the future. The assurance of comfort in the declining years of life depends largely upon the result of work done during the earning or active period of his professional career. An important problem, then, is to know how to provide best for the future; how to lighten the burden of declining years. For advice concerning this, let us turn to one who, by common consent, has made a pronounced success of his life's work—Dr. C. N. Johnson, of Chicago. In an address delivered before The National Dental Association, Lanesville, in January last, he expressed the opinion that the first investment for a professional man should be a home. A home is not necessarily an investment for profit, but rather a form of protection for the family. It has also a sentimental value. A property owner is a more tangible asset in a community than is he who moves about from place to place, staying nowhere long enough to become actively identified. It is also true that the public favors a professional man who establishes himself by reason of his taking up a permanent residence.

Dr. Johnson is of the opinion that one of the first investments for a dentist to make is in life insurance, because this is a guarantee for the safety of his family in case he, the provider, is taken away. A particular kind of insurance is favored by Dr. Johnson. He says,

"I would not advise the form of insurance which compels a man to pay during his lifetime, and which is collectable only in case of death. This frequently works a hardship on a man in his last days, at a time when the burdens of business should be eased. An endowment policy which matures in a given number of years, and can be realized on at a period of life when the beneficiary is supposed to have learned how to invest his money, or mayhap, when he needs it to live upon, is preferable in every way. This brings the burden of meeting premiums in the productive time of life, when it can best be borne, and the maturity late in life when it is most needed. Meanwhile, your family is protected against want."

To those who like to take a "flier" in stocks, there is a word of advice. Anyone who earns his money by very hard effort cannot afford to lose it recklessly. Dr. Johnson believes "that the psychology of the situation is such that it is dangerous for him to win. If a man who earns his money as slowly and laboriously as does a dentist suddenly makes money by speculation, it is not within the power of human nature to convince him that he cannot make more the same way." Usually in the end he becomes a loser. All around us we see professional men who have become financial wrecks because of the desire to get rich quickly. "Again," says Dr. Johnson, "it is inconceivable that a dentist can give due attention to his work at the chair whilst all the time his mind is centred upon the ticker and the news it is going to bring him. Something is going to suffer, and that 'something' is bound to be his work."

The purchase of stocks as a legitimate investment is not objected to by the author; indeed, he rather commends it. This is his opinion: "There is no objection to a dentist making money in stocks by buying when they are low and selling when they are high, and this can frequently be done by keeping one's head and not being too anxious to make large profits. In a general way, the time to buy is when everybody else has gone mad and sold in a panic on the theory that the whole country has gone to destruction. There is invariably a period of stagnation after such an event, when the observant buyer can pick up some stable stocks at a very reasonable price. Conversely, the time to sell, if you sell at all, is when the frenzy of speculation has carried all stocks beyond their actual value, and the public seem to proceed on the theory that there is no limit to the advance. Remember that in stocks, as with everything else, there is a sane level to be reached some day; and the man who has not compromised himself by buying on margin can afford to wait."

First mortgages offer a particularly attractive form of investment. Provided the property has been valued by an expert appraiser, the chances for loss are very slim. This is one of the oldest and most approved forms of investment.

Another convenient way to dispose of surplus means is in bonds. Dr. Johnson says, "True, there is little excitement about dealing in bonds, neither are there sudden or enormous profits. But for safety and convenience, and for steady and certain income, there is nothing to compare with bonds. And in the long run what seems to start out slowly will, after a few years, begin to accumulate very rapidly."

An added hint is given us by the author, who would have us look upon the dividends on stock, the maturing coupons on bonds, and the accumulated interest on mortgages as "a fund entirely separate from an expense fund. You paid your expenses without them before, and you can do it now. These profits on your investments should invariably be reinvested, so that they in turn begin to make more money for you."

Report of Dental Operations---C.A.D.C. Overseas

Headquarters, C.A.D.C., Room 45,
Pembroke House, 133 Oxford St., London, W. 1.
July 21st, 1917.

Dental operations performed by Officers of the Canadian Army Dental Corps
in England, France and B. M. E. F., from April 1st to June 30th, 1917,
and also showing the grand total of work completed since
July 15th, 1915.

Total operations reported to:	Fill-ings.	Treat-ments.	Den-tures.	Prophy-laxis.	Extrac-tions.	Devital-izing.	Total.
March 31st, 1917	295,277	72,696	50,773	31,165	254,187	32,915	737,013
April 30th, 1917	20,494	8,633	5,623	2,314	10,013	1,724	48,801
May 31st, 1917	24,465	11,621	6,023	2,795	13,085	2,555	60,545
June 30th, 1917	24,083	13,047	6,145	4,197	11,353	2,519	61,344
Dental reports from Overseas not shown in previous returns are as follows:	20,422	5,304	6,008	3,094	9,059	3,746	47,633
Total	384,741	111,301	74,572	43,565	297,697	43,459	955,355

J. ALEX. ARMSTRONG, COL.,
Director of Dental Services..

Results of Dominion Dental Council Examinations, 1917

MAJOR W. D. COWAN, Secretary-Treasurer of the Dominion Dental Council, has announced the results of the recent Dominion Dental Council examinations. The following candidates passed in the subjects named:—

Jurisprudence and Ethics.—Dr. C. N. Dunbar, New Glasgow, N.S.,
Examiner.

Messrs. Astle, Berry, Barber, Coursier, Collard, Crosby, Fulford, Fergusson, Holt, Hally, Loveridge, Long, McCutcheon, Murray, Mullett, Nichols, Plunkett, Robb, Truemner and Young.

Pathology and Bacteriology.—Dr. D. Norman Ross, Winnipeg, Examiner.

Messrs. Astle, Adamson, Berry, Barber, Coursier, Collard, Fulford, Finnigan, Holt, Hally, Loveridge, Long, McCutcheon, Murray, Maranda, Mullett, Plunkett, Robb, Stultz, Truemner and Young.

Materia Medica and Therapeutics.—Dr. W. P. Broderick, St. John, N. B., Examiner.

Messrs. Astle, Adamson, Coursier, Collard, Finnigan, Gillespie, Holt, Loveridge, Plunkett, Robb, and Stultz.

Operative Dentistry (Clinical).—Dr. Wallace Seccombe, Toronto, and Dr. Ritchie, Halifax, Examiners.

Messrs. Astle, Bell, Berry, Barber, Babcock, Bright, Collard, Coursier, Crosby, Fulford, Fergusson, Gilbert, Hally, Ingram, Loveridge, Long, Murphy, McCutcheon, Murray, Maranda, Mullett, Nicholls, Phillips, Plunkett, Ross, Thompson, Truemner, and Young.

Anatomy.—Dr. C. H. Weicker, Regina, Examiner.

Messrs. Astle, Blondin, Coursier, Collard, Clemence, Connors, Dent, Denimock, Dickson, Flett, Holt, Henderson, Hotham, Hartford, Hally, Loveridge, Laidlaw, MacKenzie (Miss), Milne, Robb, Richardson, Shortreed, Stewart and Wood.

Operative Dentistry (Paper).—Dr. W. A. Black, Toronto, Examiner.

Messrs. Astle, Berry, Barber, Coursier, Collard, Crosby, Fulford, Fergusson, Holt, Hally, Loveridge, Long, McCutcheon, Murray, Maranda, Mullett, Nichols, Plunkett, Robb, Truemner and Young.

Physiology and Histology.—Dr. A. W. Cogswell, Halifax, Examiner.

Messrs. Astle, Blondin, Coursier, Collard, Clemence, Connors, Dent, Dinmock, Dickson, Flett, Gillespie, Holt, Henderson, Hotham, Hartford, Loveridge, Laidlaw, MacKenzie (Miss), Robb, Richardson, Stewart and Wood.

Prosthetic Dentistry (Paper).—Dr. J. W. Clay, Calgary, Examiner.

Messrs. Astle, Berry, Barber, Coursier, Collard, Crosby, Fulford, Fergusson, Holt, Hally, Loveridge, Long, McCutcheon, Murray, Maranda, Mullett, Nichols, Plunkett, Robb, Truemner and Young.

Medicine, Surgery and Anaesthetics.—Dr. C. N. Abbott, London, Ont., Examiner.

Messrs. Astle, Berry, Barber, Collard, Crosby, Fulford, Fergusson, Hally, Loveridge, Long, Murray, Maranda, Mullett, Plunkett, Robb, Truemner, and Young.

Orthodontia.—Dr. Ross Thomas, London, Ont., Examiner.

Messrs. Astle, Berry, Barber, Coursier, Collard, Crosby, Fulford, Fergusson, Holt, Hally, Loveridge, Long, McCutcheon, Murray, Maranda, Mullett, Plunkett, Robb, Truemner and Young.

Physics and Chemistry.—Dr. H. S. Thomson, D.M.D., Moncton, N. B., Examiner.

Messrs. Astle, Coursier, Connors, Dent, Dinmock, Dickson, Finnigan, Holt, Henderson, Hally, Loveridge, Laidlaw, Robb and Wood.

Prosthetic Dentistry (Clinical).—Dr. Wallace Seccombe, Toronto, and Dr. Ritchie, Halifax, Examiners.

Messrs. Astle, Bell, Berry, Barber, Babcock, Bright, Collard, Coursier, Crosby, Fulford, Fergusson, Gilbert, Hally, Loveridge, Long, Murphy, McCutcheon, Murray, Maranda, Mullett, Nicholls, Phillips, Plunkett, Robb, Thompson, Truemner and Young.

REPORT OF STANDING, YEAR 1917.

Name	Operative Dentistry	Prosthetic Dentistry	Operative Dentistry	Prosthetic Dentistry and Metalurgy	Orthodontia	Pathology and Bacteriology	Material Medical and Therapeutics	Anatomy	Physiology and Histology	Medicine, Surgery and Anaesthetics	Physics, Chemistry	Jurisprudence and Ethics
Astle, W. W.	90	90	92	81	79	69	86	78	74	54	62	85
Adamson, H. J. ....	..	..	..	..	..	63	82	..	..	..	..	..
Bell, F. E.	91	85	..	..	..	..	..	..	..	..	..	..
Berry, Kenneth	87	76	89	85	86	79	..	..	..	55	..	79
Barber, W. H.	82	77	93	94	80	75	..	..	..	62	..	64
Blondin, M. H. ....	..	..	..	..	..	..	..	68	74	..	..	..
Babcock, A. B.	84	95	..	..	..	..	..	..	..	..	..	..
Bright, R. J. R.	92	75	..	..	..	..	..	..	..	..	..	..
Coursier, H. L.	85	85	97	81	91	74	92	66	71	44	58	84
Collard, C. R.	80	80	89	89	89	78	95	59	65	55	74	64
Crosby, C. R.	80	77	84	81	75	..	..	..	..	63	..	73
Clemence, T. C. ....	..	..	..	..	..	..	..	76	79	..	..	..
Connors, M. C. ....	..	..	..	..	..	..	..	85	72	..	85	..
Dent, F. E. ....	..	..	..	..	..	..	..	59	59	..	67	..
Dimmick, R. R. ....	..	..	..	..	..	..	..	70	63	..	78	..
Dickson, J. A. ....	..	..	..	..	..	..	..	59	59	..	80	..
Fulford, C. H.	84	85	85	83	90	82	..	..	..	60	..	66
Fergusson, H. V.	83	79	90	92	77	..	..	..	..	61	..	80
Finnigan, L. M. ....	..	..	..	..	..	65	90	..	..	..	..	..
Flett, D. M. ....	..	..	..	..	..	..	..	71	64	..	..	..
Gilbert, R. A.	85	88	..	..	..	..	..	..	..	..	..	..
Gillespie, W. L. ....	..	..	..	..	..	..	75	..	58	..	..	..
Holt, T. F. ....	..	..	96	89	78	72	86	67	82	41	50	75
Henderson, H. K. ....	..	..	..	..	..	..	..	65	75	..	59	..
Hotham, R. J. ....	..	..	..	..	..	..	..	93	60	..	..	..
Hartford, H. A. ....	..	..	..	..	..	..	..	72	50	..	..	..
Haley, C. J.	77	77	83	97	77	71	..	83	..	57	61	69
Ingram, Thornton ..	84	..	..	..	..	..	..	..	..	..	..	..
Loveridge, W. A.	84	90	91	94	98	84	94	66	60	93	62	71
Long, J. B. W.	80	85	96	99	87	79	..	..	..	65	..	84
Laidlaw, A. N. ....	..	..	..	..	..	..	..	83	70	..	57	..
Murphy, H. J.	79	75	..	..	..	..	..	..	..	..	..	..
Mackenzie, A. C. ....	..	..	..	..	..	..	..	73	58	..	..	..
McCutcheon, J. O.	77	82	86	70	82	77	..	..	..	48	..	77
Murray, G. R.	77	82	86	89	92	79	..	..	..	70	..	70
Musgrave, R. G. ....	..	..	..	..	..	..	..	..	45	..	32	..
Milne, J. A. ....	..	..	..	..	..	..	..	68	45	..	..	..
Maranda, H.	78	77	82	77	66	66	..	..	..	63	..	43
Mullett, H. J.	81	82	88	92	92	65	..	..	..	58	..	75
Nichols, M. P.	86	81	94	78	..	..	..	..	..	..	..	72
Phillips, S. J.	87	90	..	..	..	..	..	..	..	..	..	..
Plunkett, J. A.	76	82	96	84	81	54	83	..	..	69	..	75
Robb, E. J.	92	86	88	83	82	73	76	67	55	63	55	86
Richardson, S. M. ....	..	..	..	..	..	..	..	91	72	..	..	..
Shiltz, G. R. ....	..	..	..	..	..	79	78	..	..	..	..	..
Shortreed, R. D. ....	..	..	..	..	..	..	..	53	45	..	..	..
Stewart, J. L. ....	..	..	..	..	..	..	..	70	55	..	45	..
Thompson, M. A.	82	78	..	..	..	..	..	..	..	..	..	..
Truemner, N. P.	80	80	93	87	81	82	..	..	..	57	..	86
Wood, A. D. ....	..	..	..	..	..	..	..	82	60	..	71	..
Young, D.	87	77	93	86	90	65	..	..	..	50	..	..

Dental Society Reports

BRITISH COLUMBIA NEWS.

DRS. J. E. BLACK and Emery C. Jones have been appointed to fill vacancies on the British Columbia Dental Council. The following passed the half-yearly examination of the B. C. Board of Examiners, July, 1917; two candidates failed:

Llewellyn Douglas, D.D.S.
Ronald A. McAllister, D.M.D.
Walter K. Sproule, D.M.D.
Harold F. Mitchell, D.M.D.
William R. Stokes, D.M.D.
Charles J. Coultas, D.M.D.
William A. Fergie, D.M.D.
Angus McInnes, D.M.D.
William H. Keller, D.M.D.
Rufus L. Davison, D.D.S.
John F. Hill, D.D.S.

PROVINCIAL DENTAL BOARD OF NOVA SCOTIA OFFICERS 1917-18.

President.....Dr. F. W. Ryan, Halifax.
Vice-President.....Dr. F. Woodbury, Halifax
Secret'y., Registrar and Treas...Dr. Geo. K. Thomson, Halifax
Executive Committee, Halifax members of the Board:
Professional Examiners: Examiners of Faculty of Dentistry, Dalhousie University.

NOVA SCOTIA DENTAL ASSOCIATION OFFICERS 1917-18.

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Vol. VII.

TORONTO, SEPTEMBER, 1917

No. 9

EDITORIAL

Hospital Dental Service

GREAT credit is due the Medical Profession for the development and wonderfully efficient organization of the modern hospital. It is but a comparatively short time since patients sought hospital accommodation only because they could not provide proper home treatment, and frequently looked upon such an event as a most unfortunate circumstance and tantamount to surrendering their last chance of life. How different to-day? Even the more wealthy citizen of the community voluntarily chooses hospital service, rather than home treatment, because of the possibility of a more efficient management of their case and the strong probability of an earlier convalescence. In other words, an institution, originally conducted for the benefit of the poor, has proved so advantageous in the treatment of disease, that the well-to-do members of society have, in case of sickness, come to take full advantage of its many facilities. A spirit of carping criticism and public prejudice, against the hospital, has given place to whole-hearted co-operation, general commendation and generous public support.

Advantage has accrued to the community through the enlarged opportunity for clinical observation which hospitals afford, and the means whereby both medical students and nurses receive a more thorough and practical training. This latter feature of hospital work has encouraged the establishment of research and experimental laboratories and the organization of Pathological Departments which are of inestimable value to the physician. Adequate X-ray, Hydro and Electro Therapy apparatus are also made readily available. The hospital, as an institution, certainly stands to-day as the most perfect modern example of the application of the principles of "the healing art."

Attention is drawn to an article published elsewhere in this issue, written by Dr. MacEachern, Superintendent of the Vancouver General Hospital. Dr. MacEachern makes a strong plea for the establishment of a dental department in every hospital. How can we conserve the best interests of the patient suffering from Arthritis or other condition, caused by foci of infection lodged about the roots of teeth, unless there be the closest possible co-operation between physician and dentist? And how can we have that co-operation without a dental service, organized along similar lines to the other services or departments of the hospital? The writer has frequently heard of hospitals where dentists were invited to organize a dental service, but where the invitation was neglected or ignored. There are, surely, dentists in every community who stand ready to co-operate with the hospital authorities and who will gladly give their time gratuitously to the operation of such a service. We are sometimes apt to complain that physicians know too little about dentistry, but after all, have dentists a relative knowledge of medicine? The time is past for such comparisons. *In the interests of the public, co-operation is the immediate necessity.* Medical and Dental Science would be appreciably advanced thereby, and much of the suffering of humanity greatly alleviated or entirely prevented.

This is surely the "next forward step" and the members of the dental profession, in every community, should see, that in so far as they are able, the highest possible standard of dental efficiency is maintained in their local hospital and that this service is rendered in such a generous and scientific manner, that credit will redound to the dental profession. We can conceive of no greater stimulus for dentistry than this, and believe there would be an immediate response upon the part of the profession and an earnest striving to make the dentistry of to-morrow, more worthy of the place it now occupies in the field of public health.

TO REMOVE THE STAIN OF IODINE.—Iodine stain can easily be removed from dental napkins and other fabrics by washing the spots in ammonia water.—C. A. K.

The man who once so wisely said
“ Be sure you’re right, then go ahead,”
Might well have added this—to wit :
“ *Be sure you’re wrong before you quit.* ”



W. CECIL TROTTER, B.A., D.D.S.
TORONTO

President, Royal College of Dental Surgeons of Ontario.

ORAL HEALTH

A JOURNAL THAT STANDS FOR THE "OUNCE OF PREVENTION," AS WELL AS THE "POUND OF CURE"

VOL. 7

TORONTO, OCTOBER, 1917

No. 10

Arsenic And Formalin in Relation to Radiolucent Areas at Root Apices

HOWARD J. MERKELEY, M.D.S., WINNIPEG.

IN the past year much has been written and many dissertations made on the shortcomings of arsenic and formalin; but to date no direct clinical evidence has been produced to prove these contentions.

It being our practice to radiograph treated teeth in all cases presenting when the patient would consent, we have some rather extensive records, especially since our charts have been carefully filled in, carrying as they do such detailed description of operative procedures. We have made considerable use of arsenious trioxide for devitalizing, as well as formalin preparation both for treatment and root filling. Before the time of conductive anaesthesia, devitalization was resorted to much oftener than at present. This will explain some notes in the appended table (re abutments).

Examination of a number of radiographs revealed the presence of radio-lucent areas at apices of roots, carrying vital pulps. Now, these can be explained only by presupposing infection, due either to decay or pyorrhea. I am thoroughly convinced that the practice of applying anodynes to aching pulps to reduce active hyperaemia and subsequently filling without devitalization should be discontinued unless a picture shows a healthy root apex. The following three plates are presented as typical of radio-lucent root apices. They may all be looked upon as infected, and as carrying vital pulps. Would it be fair to devitalize these with arsenic and then radiograph in a few years, blame the radio-lucent areas that would show?

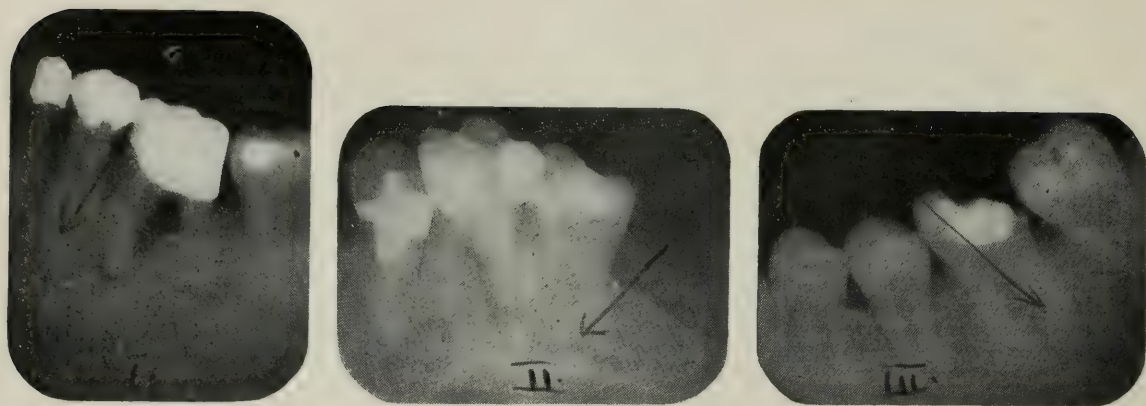


Plate 1 shows a lower second bicuspid carrying a vital pulp, but note a small area involved at the apex.

Plate 2 shows an upper second molar (vital), yet there are very definite areas at the root apices.

Plate 3 shows a lower first molar, vital. It also has a rarefied area at its root apices.

These areas may not be particularly clear in the reproduction, but they show fairly well in the originals. The foregoing pictures are not isolated examples but are conditions met with in every day practice by those doing radiography. It will then be seen how careful we must be in reading cause and effect.

The following cases are all those examined within the last two or three months. All root canal operations are personal work with very definite data. The list could be supplemented quite easily, but this will, I think, suffice. No cases were passed over; all are given where arsenic was used for devitalizing and the root subsequently filled with a formalin paste.

I am not dealing now with questions of technique nor infection. These would constitute each a paper by itself.

A splint as used below means for pyorrhea work; the abutments are for bridges. Retention is very similar in effect to deep cavities referable mostly to anteriors, where corners were badly involved, post anchorage being used.

Location—	Why devitalized	Time elapsed since devitalizing	Radio-lucency at apex.
Two upper centrals	Aching	4 years	yes.
Two upper centrals	Splint	3½ "	no.
Upper first molar	Ached	2 "	yes.
Upper lateral	Retention	3 "	yes.
Upper lateral	Splint	2½ "	no.
Upper cuspid	Ached	3 "	yes.
Upper cuspid	Retention	3 "	no.
Upper cuspid	Retention	4 "	no.
Upper first bicuspid	Retention	3½ "	no.
Two upper first bicuspids	Splint	3½ "	no.
Upper first bicuspid	Retention	4 "	yes.
Upper first molar	Aching	3½ "	yes.
Upper first molar	Very deep	½ "	no.
Upper first molar	Very deep	1 "	yes.
Upper first molar	Very deep	3 "	yes.
Two upper first molars	Abt. pyorrhea	3½ "	no.
Upper second molar	Abt. pyorrhea	2 "	no.
Upper second molar	Very deep	3 "	no.

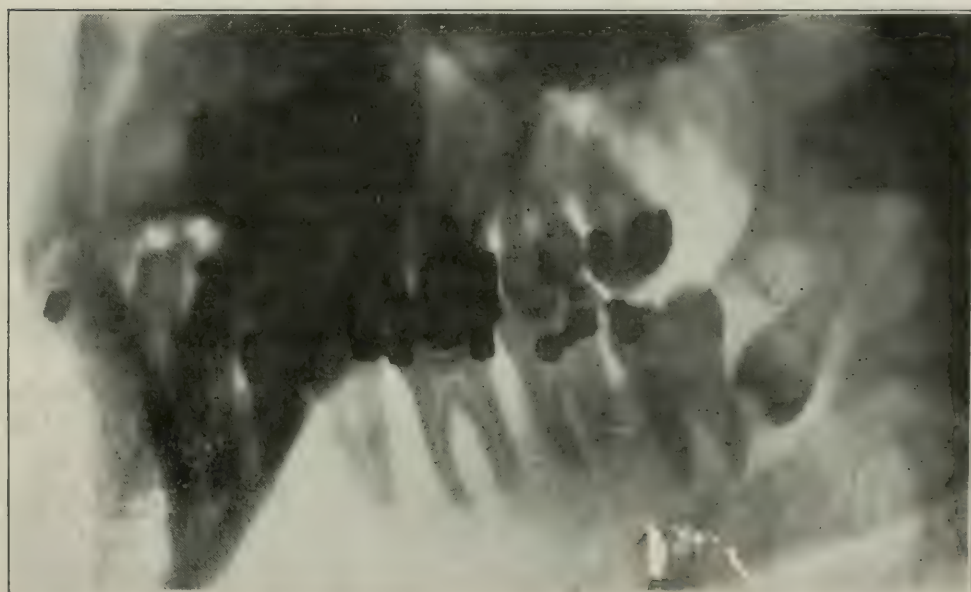
Upper second molar	Deep	1	..	no.
Upper second molar	Abutment	3	..	no.
Two upper second molars	Abutment	3 ¹ / ₂	..	no.
Upper third molar	Deep	3	..	yes.
Upper third molar	Deep	2	..	yes.
Upper third molar	Aching	1	..	yes.
Lower central	Splint	1	..	no.
Lower cuspid	Splint	1	..	no.
Lower cuspid	Abutment	3	..	no.
Two lower first bicuspid	Splint	3 ¹ / ₂	..	no.
Lower first bicuspid	Abutment	1	..	no.
Lower second bicuspid	Abutment	1	..	no.
Lower second bicuspid	Abutment	2 ¹ / ₂	..	no.
Lower first molar	Deep	2	..	no.
Lower first molar	Deep	2 ¹ / ₂	..	yes.
Lower first molar	Ached	1	..	no.
Lower first molar	Ached	2 ¹ / ₂	..	yes.
Lower second molar	Abutment	1	..	no.
Two lower second molars	Abutment	3 ¹ / ₂	..	no.
Lower third molar	Abutment	1	..	no.

The above, I believe, needs no explanation. The deliberate devitalizations of healthy pulps are sharply demarked from the pulps in questionable condition.

Personal Mention

DR. C. A. SNELL, who has been in general practice in Essex, has removed to Toronto for the purpose of specializing in the practice of Pyorrhea. Dr. Snell was president of the Ontario Dental Society in 1914, and has always taken an active interest in the affairs of the profession. His many friends will be glad to learn of his devoting himself to this speciality and wish him every success.

An Impacted Fourth Molar



ORAL HEALTH received the above skiagraph through the kindness of Dr. Merkeley. A badly impacted lower fourth molar is clearly shown. Dr. McInnis, of Winnipeg, was the radiographer.

Canadian Dentistry and National Service

AN AUTHORITATIVE SURVEY OF PRE-WAR AND PRESENT CONDITIONS OF THE DENTAL PROFESSION, IN THE DOMINION OF CANADA.

WALLACE SECCOMBE, D.D.S., TORONTO.

WHAT Canadian dentist has not asked himself a hundred times, during the past three years,—Is it my duty to “carry-on” in my present work or don khaki and join some branch of the Militia? The question recurs again and again, and we ask ourselves,—In what capacity can I best serve my country and civilization in the present world crisis? The material herein presented has been gathered in the hope that the facts stated, may help Canadian Dentists to find a satisfying answer to these questions, and arrive at the wisest and best possible solution of the important problems involved.

There has developed, in recent years, a particularly urgent public demand for dental service. This demand has been occasioned, primarily, by the prevalence of Dental disease and because people have come to know that a direct relationship exists between good health, and the health and cleanliness of the oral cavity. Dentistry has become an integral part of every well directed public health movement. Dental clinics are a recognized department in many hospitals and public schools, and also in many institutions and large commercial enterprises. Numerous factories and large offices now have their own dental officer, with a complete dental equipment installed upon the premises. The most skillful service is thus rendered the employes, with the minimum of expense, loss of time and waste energy. These more recent developments in dentistry, have created greater demands upon the profession of to-day, than conditions a few years ago would have seemed possible.

It takes four years, to educate and train a dental student to that degree of judgment and skill, required in actual practice. Consequently, the public demand for dental services during the next few years, must be anticipated and be provided for to-day, in addition to the immediate requirements.

In Canada the war has placed a heavy burden upon the already meagre ranks of the dental profession. No less than 324 graduates and 144 dental students have joined the Canadian Army Dental Corps, and are rendering vital service to the fighting forces, both in Canada and overseas. In addition to this number, 21 graduates and 30 undergraduates joined other branches of the Militia, making a grand total of 375, as the dental profession's contribution in man-power to the Militia.

The question now arises, what further national demands should the dental profession prepare itself to meet? Should the war continue for some years, what further demands for the supply of dental officers and sergeants may be expected from the Militia? What further number of Canadian dentists could be spared from civil practice? How many dental students are at present in attendance at the Canadian Dental Colleges in preparation for civil and military practice? These important questions can be answered satisfactorily only by having available, for study and comparison, up-to-date and authentic census returns of Canadian dentistry.

The writer was authorized last December, by the National Service Board of Canada, to obtain a census of Canadian dentistry, embracing the following information:

1. Number of practising dentists previous to war.
2. Number of dentists per thousand of population.
3. Number of dentists now in practice.
4. Present number per thousand of population.
5. Number of dental students in the colleges of the Dominion.
6. Possible future requirements of the Canadian Army Dental Corps.

A number of members of the profession, representing the several Provinces of Canada, were invited to co-operate by securing the desired information and vouching for its accuracy.

The writer desires to gratefully acknowledge the prompt way in which the following members responded to every request for information, and carefully compiled and vouched for the census returns for their respective provinces:—

Prince Edward Island	—Dr. J. S. Bagnall,
Nova Scotia	—Major Geo. K. Thomson,
New Brunswick	—Major Frank A. Godsoe,
Quebec	—Dr. Eudore Dubeau and Dr. J. S. Ibbotson,
Ontario	—Dr. W. E. Willmott,
Manitoba	—Dr. Manly Bowles,
Saskatchewan	—Dr. L. D. J. Fasken,
Alberta	—Dr. Jas. McPherson,
British Columbia	—Major H. T. Minogue.

RATIO OF DENTISTS TO POPULATION FROM THE YEARS 1881 TO 1911.

Official statistics covering population and occupations of the people of Canada, have been compiled at intervals of ten years. The following table indicates the total number of dentists, and the total population of the Dominion of Canada for each of these periods commencing with the year 1881:

Year.	Number of Dentists	Total Population	Dentists Per capita.
1881	510	4,324,810	1 to 8480
1891	753	4,833,239	1 to 6418
1901	1310	5,371,315	1 to 4100
1911	2183	7,206,643	1 to 3301

It is interesting to note the remarkable increase in the number of dentists, per capita, which occurred during this thirty-year interval,—an increase amounting to over two and a half times as many dentists, per thousand of population. This increase occurred in each of the ten-year periods, as follows:

Period.	P. C. increase in popula'n.	Increase in Dentists	Difference
From 1881 to 1891	12%	48%	36%
From 1891 to 1901	11%	74%	63%
From 1901 to 1911	34%	66%	32%

CONDITIONS IN CANADA AND UNITED STATES COMPARED.

Notwithstanding this increase, however, the census returns for 1911 show conclusively that the ratio of dentists to population is much higher in the United States than in the Dominion of Canada. The figures by provinces for the year 1911, and by States for the year 1912, are as follows:

DOMINION OF CANADA.

Province	No. of Dentists	Population	Ratio.
Prince Edward Island	22	93,728	1 to 4260
Nova Scotia	125	492,338	1 to 3938
New Brunswick	98	351,889	1 to 3590
Quebec	327	2,003,232	1 to 6126
Ontario	1,127	2,523,274	1 to 2238
Manitoba	130	455,614	1 to 3504
Saskatchewan	89	492,432	1 to 5532
Alberta	105	374,663	1 to 3568
British Columbia	160	392,480	1 to 2453
Yukon . . . . .	...	8,512	
Northwest Territories . . . . .	...	18,481	
Total	2,183	7,206,643	1 to 3301

UNITED STATES OF AMERICA.

State.	No. of Dentists	Population	Ratio.
Alabama	544	2,138,093	1 to 3950
Alaska	34	64,356	1 to 1892
Arizona	64	204,354	1 to 3163
Arkansas	359	1,574,440	1 to 4356
California	1903	2,377,549	1 to 1249
Colorado	492	799,024	1 to 1624
Connecticut	611	1,114,756	1 to 1824
Delaware	80	202,322	1 to 2529
Florida	273	752,619	1 to 2756
Georgia	630	2,609,121	1 to 4141
Idaho	176	325,594	1 to 1849
Illinois	3203	5,638,591	1 to 1760
Indiana	1245	2,700,876	1 to 2169

Iowa	1198	2,224,771	1 to 1857
Kansas	834	1,690,949	1 to 2025
Kentucky	786	2,289,905	1 to 2913
Louisiana	454	1,656,388	1 to 3648
Maine	403	742,371	1 to 1842
Maryland	578	1,295,346	1 to 2241
Massachusetts	2060	3,336,416	1 to 1619
Michigan	1421	2,810,173	1 to 1977
Minnesota	933	2,075,708	1 to 2224
Mississippi	343	1,797,144	1 to 5224
Missouri	1377	3,293,335	1 to 2391
Montana	214	376,053	1 to 1756
Nebraska	637	1,192,214	1 to 1871
Nevada	45	81,857	1 to 1819
New Hampshire	217	430,572	1 to 1984
New Jersey	928	2,537,167	1 to 2734
New Mexico	75	327,301	1 to 4364
New York	4270	9,113,614	1 to 2134
North Carolina	430	2,206,287	1 to 5130
North Dakota	179	577,056	1 to 3223
Ohio	2190	4,767,121	1 to 2176
Oklahoma	326	1,657,155	1 to 5083
Oregon	449	672,765	1 to 1498
Pennsylvania	3229	7,665,111	1 to 2373
Rhode Island	278	542,610	1 to 1951
South Carolina	360	1,515,400	1 to 4209
South Dakota	200	583,888	1 to 2919
Tennessee	560	2,184,789	1 to 3901
Texas	940	3,896,542	1 to 4145
Utah	208	373,351	1 to 1795
Vermont	149	355,956	1 to 2389
Virginia	449	2,061,612	1 to 4593
Washington	611	1,141,990	1 to 1869
West Virginia	375	1,221,119	1 to 3259
Wisconsin	1181	2,333,860	1 to 1977
Wyoming	57	145,965	1 to 2560
Total	38,900	92,006,625	1 to 2365

It is thus to be noted, that the ratio of dentists to population, taking these two countries as a whole, compares for the years 1911-12 as follows:

United States	1 to 2365
Dominion of Canada	1 to 3301

PRESENT CONDITIONS IN THE DOMINION OF CANADA.

From the year 1911 to the beginning of the war in 1914, Canada enjoyed unusual prosperity, and population increased in a most remarkable way. This increase was particularly marked throughout the Canadian Northwest. Notwithstanding the lack of immigration since the beginning of the war, and the very heavy enlistments from the Western Provinces, recently available official statistics for the year 1916 show large increases over 1911.

Province.	Population 1911.	Population 1916.	Increase.
Manitoba	255,614	553,860	200%
Saskatchewan	224,322	341,844	300%
Alberta	354,663	596,525	320%

Needless to say, the Eastern Provinces find themselves in a somewhat different position. Government officials estimate the present increase in population in Ontario and the Eastern Provinces to range over 1911 anywhere from two per cent. to ten per cent.

Taking Canada as a whole, however, conservative official estimates place our present population at about 8,000,000, or an increase over 1911 of about ten per cent., and it is upon this estimate that our present need for dentists must be based.

CANADIAN DENTAL CENSUS, 1917.

The following table gives the 1917 Dental Census in detail, and also shows the number of practising dentists at the beginning of the war (July, 1914), with particulars of the changes since that time.

DENTAL PRACTITIONERS.

	In practice July, 1914	Added to Register Since July, 1914	No. Enlisted Deceased or out of practice since the war began	In Practice 1917
Prince Edward Island ...	21	3	5	19
Nova Scotia	120	5	19	106
New Brunswick	92	11	29	74
Quebec	252	50	39	263
Ontario	984	168	229	923
Manitoba ..	122	30	44	108
Saskatchewan ..	110	18	22	106
Alberta ..	202	15	75	142
British Columbia	146	11	37	120
Total ..	2049	311	499	1861

In every Province, except Quebec, a decrease has occurred in the number of dentists in practice now, compared with 1914.

1917 RATIO OF DENTISTS TO POPULATION IN CANADA ACCORDING TO PROVINCES.

Province.	Population, 1917 (Estimated)	No. of Den- tists, 1917	No. of Dentists per capita
Prince Edward Island	95,000	19	5,000
Nova Scotia	500,000	106	4,717
New Brunswick	360,000	74	4,865
Quebec	2,203,000	263	8,376
Ontario	2,770,000	923	3,001
Manitoba ..	550,000	108	5,092
Saskatchewan ..	637,000	106	6,009
Alberta ..	490,000	142	3,450
British Columbia	395,000	120	3,290
Total ..	8,000,000	1,861	4,298

Taking the Dominion of Canada as a whole, the present per capita ratio is one to 2,998 of population. There are only 1,861 dentists in Canada as compared with 2,183 in 1911.

There has, unquestionably, been a greater demand for dental service during the past five years than in any other similar period in the history of the world, and yet the present per capita ratio in Canada shows a marked decrease in dentists as compared with 1911. Having regard to the increased public demand and to the conditions that obtain in the United States, the present ratio of dentists to population, (taking Canada as a whole), certainly should not be less than one dentist to 3,000 population, or, in other words, 2,666 dentists to 8,000,000. Taking, however, even the same ratio as obtained in the Dominion in the year 1911, (1 to 3,301), there would be in practice to-day 2,423 dentists. The 1917 dental census shows that 1,861 dentists are now in practice, thus indicating, even upon the 1911 basis, a normal shortage in Canada of 562 dentists.

Should the Government plans be put into effect, of calling to the colors 100,000 additional men, approximately 100 additional dentists would doubtless be required for service in the Canadian Army Dental Corps. Such a draft would render the dental situation in Canada all the more acute, because a greater ratio of dentists is required in the Army than in civil practice. Furthermore, though the civil population would be decreased by 100,000, this number would be so distributed throughout the country, that their absence would not have an appreciable effect upon the practice of any one dentist.

The dentists are already well aware of a shortage in their ranks, because of the additional and insistent public demand for their services, since the war began. Conditions are particularly acute in many rural communities where it has become necessary for the public to travel great distances to reach a dentist.

As a further evidence of the shortage of dentists, it might be cited that the Department of Colonization and Development, of the Canadian Pacific Railway Co., sent the following letter, dated June 11, 1917, to the University of Toronto:

"Dear Sirs:—

"I enclose two copies of our new issue of 'Business Opportunities' in Western Canada, and would draw your attention to the openings that are existent for the services of dentists, and it may be that this will be interesting to some of your students who are qualifying and are anxious to take up the practice of dentistry.

"Yours truly,

"(Signed) JOHN T. SWEETING,

"Industrial Agent."

The places referred to as good openings for dental practitioners were as follows:

Abbey, Admiral, Alderson, Alameda, Altona, Aneroid, Ashcroft, Blairmore, Blackie, Bow Island, Broadview, Bromhead, Brooks, Carberry, Chaplin, Clive, Colonsay, Conquest, Consort, Consul, Crandall, Crystal City, Denzil, Drake, Eastend, Emerson, Esterhazy, Etzikom, Fannystelle, Fillmore, Foremost, Glenboro, Govenlock, Herschel, Inverlake, Jenner, Kandahar, Kincaid, Langenburg, Leduc, Limerick, Lomond, Loreburn, Loyalist, Macoun, Manyberries, Maryfield, Mather, Maxim, Meyronne, Miniota, Mission, Morris, Morse, Mortlach, Nemiscam, Newdale, Neudorf, Oal Lake, Ogema, Okotoks, Pakowki, Pennant, Perdue, Ponoka, Pontix, Prelate, Primate, Prussia, Qu'Appelle, Retlaw, Robsart, Rocanville, Saltcoats, Segewick, Seven Persons, Shoal Lake, Simpson, Stoughton, Strathmore, Tribune, Tompkins, Vanguard, Verwood, Vidora, Warner, Webb, Wilcox, Windthorst, Woodrow, Yellow Grass.

CENSUS OF CANADIAN DENTAL COLLEGES.

It is the duty of the dental profession to not only maintain proper dental standards, but also to supply sufficient dentists to adequately meet the public demand for dental service. In other words, it is the duty of Provincial Dental Boards to serve the public in two ways: First, to see that dental licentiates are proficient and honest in their practice, and second, to be careful to see that dentists are licensed in sufficient number to give the public satisfactory service.

It is questionable whether the Canadian Dental Colleges have been graduating sufficient men to provide for (a) the losses to the profession through death and otherwise, and (b) the normal increases in population from year to year.

Should the war be still in progress in October, 1917, and should the Canadian dental students who were in attendance last session return to college (men who are not physically fit, or who, for some other reason have not enlisted), it is estimated that the following students will register at the Canadian Dental Colleges, for session 1917-18:

College.		Class			
		Freshman	Sophomore	Junior	Senior
Dalhousie	Not known	5	6	5	
McGill	Not known	14	15	10	
Laval	Not known	32	29	25	
Royal College	Not known	63	56	9	
Total		114	106	49	

Allowing at least 5% annually for shrinkage in number, due to sickness, failure, etc., etc.

47	men	would	graduate	in	1918
96	"	"	"	"	1919
99	"	"	"	"	1920

These numbers are no more than sufficient to provide for the normal shrinkage in the ranks of the profession, much less take care

of the increasing demand for dental service and increases in population.

Conceivably, the war may last for some years, and to avoid national and individual waste, a policy should, and doubtless will be followed, of employing the soldier, wherever possible, in that branch of service in which he has received special training, and to which he most likely will devote himself in times of peace. Canada will have a stupendous after-the-war problem, in re-establishing her soldiery upon a peace footing. It is essential that every man possible, be so employed in the Militia, that upon discharge, he may return without delay to similar service in civil life.

Do not these facts lead irresistably to the conclusion that, under prevailing conditions, both graduate and undergraduate dentists render the greatest possible national service, by serving in either military or civil dental practice? Every Canadian dentist, no matter what age, should be rendered available to the Canadian Army Dental Corps, as and when required. In view of the present situation, the Government should place in the hands of the Militia, the power to call-up *any Canadian dentist* for service in the Dental Corps. Such provision would remove all limitations from the C.A.D.C. in its choice of men, would raise the standard of dental service and give the brave boys in khaki the best possible dental attention.

Oral Prophylaxis

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[*This address was recently delivered before the Iowa State Dental Society, and is well worth careful study. Oral Health is indebted to the Dental Summary for courtesy of publication.—Editor.*]

PROPHYLAXIS is the means of guarding against or preventing disease. Oral prophylaxis means carrying out the highest ideals in dentistry, giving such instructions to children as will help to develop good masticatory organs, keeping well mouths healthy, restoring health to diseased tissues, doing that which seems best in our judgment with those mouths presented to us in a broken-down condition, and then giving the patients such instruction in home care as will enable them to help us keep their mouths in a hygienic condition. Periodical visits to the dentist are very essential. The more we can educate our patients in modern, up-to-date dentistry, and especially along the lines of prevention, the more they will appreciate the work we are doing, and unless the dentist has a clear understanding of himself, and is able to make the patient fully appreciate what he is trying to accomplish, oral prophylaxis will be a flat failure.

Every dental office should be a little centralizing school of dental education. When patients are in the operating chair, it is our duty to talk on subjects of dentistry which will be beneficial to them. Some patients become interested from the start, while it is hard to make others comprehend. It requires some tact to make the latter class realize the care necessary to accomplish results, that you are striving hard to better their condition and are not working merely for monetary consideration.

One of the objects of this course is to impress upon the dentists the necessity of educating their patients to appreciate preventive dentistry so that they will realize they are getting value received when charged a legitimate fee. When patients refer their friends to us for this work rather than waiting for pathological conditions to arise, we feel that a new era in dentistry is developing.

IDEAL PROPHYLAXIS.

The old idea that a prospective mother should shun a dental office is a fallacy. A physician should refer her to a dentist very early, for there are physiological reasons why her teeth are more prone to decay at this time than when she is in normal condition. If any cavities exist, they should be prepared and filled as painlessly as possible, putting the mouth in such condition as to enable her to masticate food thoroughly. In many cases inlays can be inserted without much pain; otherwise cements should be used. If incurable abscesses exist, it is better for both mother and child that all such teeth be extracted rather than allow the constant absorption of pus. Also, she should have a prophylaxis treatment every month. If she is unable to come to the office, she ought to be treated at home. In connection with suggestions regarding pre-natal precautions, a pretty good program for the prospective mother is plenty of good, plain, wholesome food, plenty of sunshine and a reasonable amount of exercise.

When the child's teeth begin to erupt, the mother or nurse should be taught to watch for and remove any foreign substance which may lodge thereon. With ordinarily good care, few cavities if any will occur. To guard against cavities between the teeth, proximal surfaces should be polished daily with dental floss or very narrow, flat tape. These surfaces of temporary molars are the most prone to decay. If any cavities should develop, they should be filled while very small, thus causing less pain and not endangering the life of the pulp. In addition to the use of the tape and floss, the tooth brush and cotton rolls should be used after each meal. Deep or improperly-formed fissures should be ground out and polished or covered with cement which possesses highly adhesive properties. I generally use one of the copper cements for this. Ames' black copper is preferable on account of its extremely adhesive property. Explain to the

patients that if these temporary teeth or their contact points are lost, the first permanent molar will come in anteriorly of where they belong, and when the bicuspid and cuspid erupt later on, there will not be room enough for them, and poor alignment, which usually causes malocclusion, with all its bad results, will follow. Thumb-sucking, adenoids and mouth breathing should be watched for and corrected.

At a very young age children should be taught to masticate thoroughly and properly. Noyes says: "If the jaws are used chiefly with an up-and-down motion and from front to back, the arch will be longer and narrower, and if there is no vigorous use of the teeth in mastication, the bones will be under-developed and the respiratory spaces consequently narrowed. Normal respiration during the development period exerts the greatest influence upon the growth of the bones. With the mouth closed, the lips are pressed against the labial surfaces of the incisors, the lower lip covering about one-third of the crowns of the upper incisors. The tongue fills the vault of the palate and pushes against the lingual surfaces of the teeth and bone. The air being partially exhausted by the soft palate lying against the base of the tongue, there is a downward pressure on the floor of the nose. With very vigorous inspiration there is a depression of the hyoid bone and consequent pull of all the muscles extending from it to the mandible and tongue; this increases the pressure on the lingual surfaces of the teeth and the downward pressure of the palate. If breathing is carried on with the mouth open, all of the influences are lacking and the results are shown in typical deformities. The changes of bone growth from birth to adult age are largely dependent upon the influence of mechanical stimuli and for full normal development vigorous normal function is necessary. It is useless to establish normal occlusion of the teeth if normal functional stimuli are not distributed by it, and it is equally useless to clear out obstructions from nasal passages if malocclusion rendered normal function impossible. The direction of growth is downward, forward and outward, increasing the distance from the floor of the nose and the floor of the orbit to the incisal edges of the teeth and increasing the depth and width of the nasal cavities." It takes exercise to develop the muscles of an athlete, also to develop the periodontal membrane, which is composed of muscle fibers.

At about five years of age, there should be a perceptible spreading of the anterior teeth. If this does not occur, a regulating appliance, which will stimulate growth of the anterior portion of the mandible, should be put on. Wearing a very simple appliance on the lower temporary teeth for a month or two at this age will frequently save a year or two of regulating at a later period in life. Fissures or pits of newly erupted molars and bicuspid should be ground out and polished, or should be protected with cement before any decalcifi-

cation has started. This procedure will prevent decay of fissures and pits, and cleanliness will prevent decay of the smooth surfaces. Some of the children in my practice have grown to the ages of twelve and fourteen years with very few, if any, cavities.

Pickerill says if he could prevent decalcification of the enamel of the teeth of children between the ages of six and thirteen in girls, and six and fifteen in boys, he thinks he would eliminate ninety per cent. of decay. Personally, I would say to give them special care up to the age of eighteen or twenty. This does not mean that most cavities occur by the time children come to the age of twelve or fourteen years, but that certain susceptible areas have become etched or decalcified, and that later on these will develop into cavities. By thorough polishing I have prevented cavities from forming in etched areas for a period of ten years, but at the cessation of the regular prophylaxis treatments, from any cause whatsoever, patients have returned, in some instances, with these formerly etched surfaces developed into cavities. Regular prophylaxis treatments should not be omitted when boys and girls are away at boarding school or on extended trips. I believe that cavities then could be prevented. So much for ideal care of the mouth.

METHOD OF PROCEDURE IN ACTUAL PRACTICE

We must take cases as they come to us. If a patient is suffering, we must relieve pain first, then get the teeth clean and the soft tissues healthy. If there are a number of cavities, clean out the decay and fill with cement, then take wax impressions of the teeth, run up models and study the case. Black claims that the average person, at the age of forty, has worn away enough tooth substance from proximal surfaces to represent the width of a central incisor, so that the arch is that much smaller, or else the contact points have worn away sufficiently for food to jam in and impinge the septal tissues. By studying the models, we can see where a little grinding of the cusps will sometimes restore occlusal planes and contact points, but where this will not accomplish the desired results, the models will show where to separate and insert well-contoured fillings with good marginal ridges, which will restore in a measure the portions worn away from the proximal surfaces. The contact point should be placed in the center of the line of stress brought to bear by the occluding teeth, so that food will be carried over the embrasure and not irritate the gums. Also, the occlusal planes should be studied, and if there is any undue lateral stress, it should be corrected by grinding. Malocclusion produces constant pounding in some portion of the periodontal membrane, thereby lessening its resistance to the infection of micro-organisms, which produces gingivitis, deeper seated inflammation and eventually pyorrhea, so that any tooth which is not occluding properly is prone to pyorrhea, or a lateral

or peridental abscess. These conditions are especially noticeable where teeth are tipping forward, following the loss of the first permanent molar; the tissues adjacent to the medial aspect of the second molar usually present an inflamed area.

Before filling cavities on the proximal surfaces, the teeth should be separated widely enough to restore the contour which would be ideal in a newly erupted tooth. Slow separation started two weeks in advance is preferable to a mechanical separator used at the time of the operation. If immediate separation is used, it is impossible to gain the normal space, as a rule, and the patient is caused excruciating pain, and this method of separating does not give sufficient room or space for the dentist to accomplish ideal results, because the separator is always in the way. By tying contractal cord or waxed floss, wrapped with cotton, between the points of contact two or three times at intervals of two days, we can usually gain all the space necessary; then put in wedge of white base plate gutta percha and let the teeth rest for a week. Soreness quickly disappears, the operation can be done with a minimum amount of pain, and the operator has room and space enough in which to do ideal work, because he is not hindered by the separator being in the way, and the teeth stay apart long enough for a well-contoured filling or inlay to be inserted and polished. I have seen enamel checks, caused by the steel points of a mechanical separator, which are bound to develop into cavities sooner or later. If time is taken to explain to patients why it is necessary to separate the teeth before putting in the filling, they will want it done, and very few patients will allow a mechanical separator to be used after having had the teeth separated with the cord or floss. I frequently make a drawing on paper to represent teeth, showing where contact points have been lost through decay, and the necks of the teeth are drawn very close together to show patients why it is necessary to separate the teeth at the gingival margins in order to restore the normal contour to the crown of the tooth and permit good circulation to the septal tissues, as well as to protect them from injury in mastication.

Explain that hard and soft tooth structure has very little to do with the decay of teeth, that the enamel rods are composed of from eighty-eight to ninety-five per cent. calcium salts, bound together by a cement substance which is composed of even higher percentage of lime salt, that enamel, whether hard or soft, is easily decalcified by the formation of acid upon its surface, and that acid usually forms under the debris, or protein plaque substance, which gathers on the tooth surface and is located only by a staining or discoloring solution. Dr. Pickerill, claims that calcium salts held in solution by carbon dioxid in the saliva will neutralize the acid formed under debris, thus inhibiting decay of teeth, that these calcium salts will permeate the outer layer of enamel, and as the carbon dioxide

thrown off, the calcium salts precipitate in the enamel surface, thereby hardening it. A number of investigators along this line believe that calcium salts are really deposited and that there is a hardening of enamel when it is placed in a proper environment. Their theory is not in perfect harmony with Dr. Pickerill's ideas, but within a short time, I believe, we will have some definite information on this subject. Of course, when there is a sufficient quantity of calcium salts in the saliva to produce such results, decay cannot take place.

From childhood up to eighteen or twenty years of age, calcium salts are utilized in building bone. After that age, such large quantities are not needed for bone construction, and it becomes a waste product and is eliminated from the body. That which is eliminated through the saliva acts as a tooth preserving property. This probably accounts, in a measure, for the cessation of decay which usually follows when a person has reached maturity. Hence, from the time the teeth erupt until their owner arrives at the age of eighteen or twenty, they are much more prone to decay, and these are the ages during which thorough prophylaxis should be kept up.

One of the things most convincing to a patient is to paint the surfaces of his teeth with a disclosing solution. This will not stain clean surfaces unless partially decalcified. Give the patient a hand mirror and let him see how much accumulation there is on even apparently clean teeth. Explain that this is a bacterial formation, and that if as much infectious and decaying matter were allowed to remain in one place on his hand for weeks and weeks as is allowed to remain on the teeth, he would be very much surprised if the tissues surrounding such a mass did not become inflamed and hypersensitive, as often takes place with the tissues surrounding the teeth. While you are removing deposits and planing or filling rough surfaces and polishing them, explain the composition of enamel to the patient and that decay is merely the result of a chemical reaction between the calcium salts of the enamel and acids resulting from fermentation, just as the rusting of a piece of steel is a chemical reaction, and is just as preventable by polishing; how starch is converted into sugar, and sugar into acids, and that all dental caries takes place under a fermenting mass, and only there; that free acid in the saliva does not destroy the enamel, that no mouth wash can penetrate these fermenting masses, that no amount of brushing will entirely remove them and that improper brushing with an abrasive does a great deal of injury to the gums and tooth surfaces.

HANDLING A TOOTH BRUSH.

Patients should be instructed to start brushing the occlusal surfaces of back teeth first, brushing the fissures with a backward, forward and side to side motion, then placing the brush well up on the incisors with the bristles pointing rootwise, and with a rolling motion,

bringing the brush toward the occlusal surface. This should be done on both buccal and lingual surfaces. When brushing the lower teeth, the tongue should be drawn well back so as to expose the gingival third of the lingual surfaces of the lower molars and bicuspid to the bristles of the brush. For brushing the lingual surfaces of the anterior teeth, a very short brush should be used, because a large sized brush usually bridges over the inside of the arch and does not touch the teeth or gums, unless held in a perpendicular position. When brushes are held in this position, the bristles are sure to pierce through and lacerate and infect the gums, thereby causing gum recession. It is a very common thing for patients to start brushing in one place, usually with a cross-wise motion at the gingival margins of some of the anterior teeth. This should be watched for and stopped. Few people do too much brushing, but when they begin brushing with an abrasive and a stiff brush in the same place year after year, the grit, combined with the first stiffness of the brush, will gradually wear away the tooth at that point, so that I believe mechanical abrasion is frequently taken for erosion.

Dr. Bunting, of Ann Arbor, who has done a great deal of experimental work on the protein plaque substances which form on the tooth surfaces, claims that saponaceous substances are contra-indicated, because they lubricate the bristles of the brush or if used in combination with a grit, each atom of grit is encapsulated and loses its property of scouring or dislodging the plaques. I never have seen a case of erosion which was not accompanied by the use, or at least did not have a history of a stiff brush, gritty dentifrices and cross brushing. Enough brushes should be kept on hand all the time so that each brush is used only once during twenty-four hours. This gives the patient a brush which is at its prime, and by adding a new one to the stock of brushes every month or two, the gums are accustomed to a good stiff brush all the time, and are thus kept hard and healthy. Where only one brush is used until it is worn out, it loses its efficiency toward the latter end of its existence, and the gums become more or less inflamed from the debris which is allowed to remain at the gingival margins. Then, when a new brush is put into use, it lacerates the tissues which have become used to the softer brush. This alone is sufficient reason for requiring patients to keep three or four brushes on hand all the time, and brushes last much longer and do much better work when used only once in twenty-four hours.

The chief benefit derived from the use of the tooth brush is the hardened and healthy condition of the gums obtained from massage, but as far as effecting cleanliness is concerned, the brush is nothing but a series of fine tooth picks and removes only loose debris from the tooth surfaces. If improperly handled it does as much if not more damage than good. Of late years I have not favored dentifrices

containing coarse grits, such as precipitated chalk, silix or pumice, because of the damage done to the tooth surfaces by improper brushing with them.

There is no tooth paste, powder or anything else which will keep teeth clean when simply applied by means of a brush, so that I try to have all of my patients go over their teeth with wooden points once or twice a week. The tooth brush should be used immediately after eating, because the protein substances of our food, if left too long on the teeth, become transformed into a gelatinous coating, which is difficult to remove.

Ribbon floss should be used to polish the proximal surfaces of the teeth at least once each day, and I recommend the application of a little paste or powder to the floss before using it. Care should be taken when passing tape between the contact points not to allow it to snap against the gum tissues. Snapping the gums can be avoided by taking a short hold of the tape, keeping it taut and holding the buccal end somewhat higher than the lingual, so that the tape passes diagonally between the contact points with sort of a saw motion.

There has been a good deal said about tooth picks, pro and con, one person advocating a quill and condemning a wooden tooth pick, and his next door neighbor holding just the opposite view. If food has jammed between the teeth, I would advocate the quickest means of getting it out, whether with silk floss or tooth picks, using care not to injure the gums, for it is commonly believed that a great deal of infection takes place through these little abraded surfaces. In fact, I think rubbing the tooth surfaces and gently massaging the gums with a wooden pick is productive of good results, for it stimulates the circulation and breaks up and removes microbic plaques and other debris. The pernicious habit of systematically jamming a tooth pick into interproximal spaces, crowding the gum tissue down and then giving the pick a twist, thereby lacerating and cutting the gums, should always be watched for and stopped, for the little pockets formed by the recession of the gums from this cause are places where debris lodges, and they make an ideal incubator for growing bacteria, thus infecting the gums and producing inflammation, which causes serumal deposits to gather and pyorrhea will follow.

EVERY DENTIST A SPECIALIST.

These suggestions with reference to care of the teeth are intended for the every-day practice of every dentist, and not merely for the specialist in pyorrhea and oral prophylaxis, because this every-day care is what preserves teeth. I believe that the man who specializes in pyorrhea and prophylaxis and confines himself to the use of pyorrhea instruments and the polishing of teeth is not doing the best work he can in his community when he depends upon men not associated with him to do the prophylactic work. Nor do I believe this method

of procedure will be successful in the dental profession, for no matter how skilfully the pyorrhea and prophylaxis specialist performs his work, it will be a failure in mouths which need repair work, unless the prosthetic man understands the causes which bring about diseased conditions of the mouth and is able to produce work which will carry out the ideals of oral hygiene. Otherwise, bands will be used where they are not indicated, and some of them not fitted overly well at that; work lacking proper contour to protect the soft tissues will be inserted; fillings, inlays, crowns and bridges which do not occlude properly or furnish support to the abutments will be constructed, thereby causing lateral stress on the process, followed by soreness, inflammation, infection and loss of the dental organs. Bridges which cannot be kept clean will be inserted, and great masses of food will lodge under them and ferment, thus making breeding places where millions of pathological germs will be incubated. The alveolar process under such a bridge frequently becomes infected, and large numbers of germs will be mixed with each morsel of food taken into the stomach. The loss of the teeth is sure to follow work done by men who do not follow out the principles necessary to maintain hygienic conditions. If teeth are lost after a specialist has once worked on them, it will be the fault of the specialist, from the viewpoint of the patient and the general practitioner, so that for these and many other reasons every dentist should be a practitioner of oral prophylaxis, if not a pyorrhea specialist. If more men practiced oral prophylaxis, there would not be as much need for repair work, for pyorrhea specialists, or M. D.'s, for the mouth is the intake of the body, and it is estimated that eighty-five per cent. of systemic diseases find their origin in foci which are located in the alveolar process, nose and tonsils, and it is believed that the gum tissues and the alveolar process which are infected from unclean tooth surfaces, are responsible for seventy-five per cent. of all these cases. In fact, it is a question whether a diseased mouth is not a source of infection for the tonsils.

ALIMENTARY INFECTION.

The alimentary canal is about thirty-three feet long. We can control only about the first three inches of it. Let us do it well and keep it in a clean and healthy condition. The belief is quite prevalent among physicians that a great many pathological conditions of the body arise from a diseased alveolar process and gum tissues. When pyorrhea pockets and abscesses with sinuses are present, pus is discharged into the mouth, and every morsel of food and every drop of saliva swallowed carry quantities of infectious matter into the stomach. Probably few live bacteria ever get into the intestinal tract, because normal gastric juice with its one-half of one per cent. of H. Cl. possesses powerful germicidal properties, but the gastric follicles do not throw out the proper fluid when pus is present; so

where pus is being swallowed continually, the food is not well prepared to enter the intestinal tract, and before it is eliminated from the body, it causes poisonous ferments to be formed and absorbed. This is also the case where food has not been masticated or ensalivated thoroughly. Uncooked starch is absolutely insoluble to any ferments of the human body, and when swallowed in that condition, it passes through the body absolutely unchanged. However, it acts as roughage, which is essential. Starch globules need to be cooked to break up their capsules, so that the ptyalin of the saliva, or the trypsen and the pancreatic juice of small intestines can act upon them, for it is only in this way that they become a food for the human being. Therefore, in order to have mastication which will preserve health, it is necessary to have twenty-eight good teeth which occlude properly and to know how to use them.

The larger percentage of infection from the alveolar process is that which takes a short cut directly into the circulation. If the infection cannot be combated rapidly enough, it may lodge and multiply in the joints, heart, or any area, the resistance of which may have been lessened, or enlarged or suppurating glands may result. Last, but not least, when masses of decaying matter are allowed to remain around the teeth, infection enters the tissues through the little ducts, glands, or openings which line the inner wall of the gingiva. These are described in Talbot's "Interstitial Gingivitis." The author also speaks of them as cul-de-sacs. Infection entering the tissues in this way frequently causes osteitis, osteomyelitis, lateral abscesses and pyorrhea.

Dr. Hartzell says: "The direct lymphatic drainage of the tissues contiguous to the teeth is the most perfect in the whole body, affording direct access to the deeper structures of the neck, maxilla and mediastinum, thereby making it possible for micro-organisms introduced into the tissues through a pyorrhea pocket or apical abscess to travel uninterruptedly into the deeper tissues of the body. Not only do the lymphatics afford direct access for micro-organisms to the circulation, but the rich plexus of blood vessels supplying the periodontal membrane and alveolar process invariably suffer from the destructive activity of pus-forming bacteria, opening the blood vessels themselves to the entrance of germs which are injected into the broken ends of these vessels by the powerful stress of occlusion during the act of mastication, thus making the spread of bacteria in the circulation a certainty."

Some of the diseases for which the mouth infection is held partially responsible are: glossitis, diseased tonsils, deafness by infection through the Eustachian tubes, catarrh of the throat and alimentary canal, dyspepsia and indigestion, suppurating glands, infected endocarditis, septic inflammation of the joints, ulcer of the stomach, rheumatic conditions, pernicious anemia with all of its bad after-effects,

tubercular glands and tuberculosis. Furthermore, diseased mouth and teeth always contain pathogenic bacteria, which would become dangerous to the person possessing them during a state of lowered resistance, and every time a person whose sputum is loaded with pathogenic bacteria expectorates, coughs or sneezes, he endangers those near him. Some people can have all kinds of debris on their teeth and mucous membrane of the mouth and gum, and yet show little tendency to decay or pyorrhea, but the constant swallowing of bacteria and their by-products must eventually have a debilitating effect upon the system.

TOOTH DESTRUCTION.

Some of our authorities suggest the lactic acid theory for the decay of teeth, while others claim never to have been able to find lactic acid in the mouth or in the masses of debris under which decay takes place. Some claim that tooth destruction is the oxidation of foreign matter on the tooth surfaces, but they all acknowledge, and clinical observations verify the claim, that if it were possible to keep the teeth always clean and maintain proper occlusion, dental caries and pyorrhea would not exist, so that unless an individual is absolutely immune to dental pathological conditions, the cleaner his mouth and teeth are kept the less trouble he will have. Even though he is not immune to dental troubles, he will have more self-respect and command more respect from those with whom he comes in contact if he has a clean mouth, than if he allows it to become filthy and remain so.

Dr. Pickerill, in his "Prevention of Dental Caries and Oral Sepsis," claims decay of teeth can be controlled by increasing the quantity and alkalinity of the saliva, and that this can be accomplished by the use of acid mouth washes and a fruit diet, or at least a fruit course at the end of a meal. He gives several formulas for mouth washes, in which he uses potassium bitartrate, commonly known as cream of tartar. He calls it acid potassium tartrate. It leaves a very clean, pleasant effect in the mouth. He also says there is nothing better than a slice of orange with which to end each meal. Thus it seems it would be better to eat grape fruit or oranges at the end of each meal, instead of at the beginning.

PREVENTION.

Some of our Research workers claim that polishing of tooth surfaces is not scientific, and they are studying ways and means of preventing dental caries by systematic treatment. In the meantime, the teeth of most patients who are being treated in this way are wasting away. At present, our best known means of preventing dental troubles is oral prophylaxis. That means keeping a mouth, as well as the teeth, in a clean, healthy condition. In order to make a success of this work, a dentist must know from experience what clean

teeth and a healthy mouth are, for his arguments lack force if he does not practice the teachings he desires his patients to follow. He must be able to convince his patients that preventive work is much more beneficial than repair work, and that nature's crowns, when in good alignment, properly formed and occluded, are better than the best porcelain and gold crowns he can make. Last, but not least, he must talk to them along the lines of preserving health, not those of simply saving a tooth. In the mind of the average individual a tooth amounts to very little, but if he realizes that that tooth, when in a diseased condition, may bring about pathological conditions which will result in chronic or possibly fatal diseases, he will pay a great deal of attention to keeping his teeth and mouth healthy, and that is what oral prophylaxis does.

A dentist must be able to present his subject in such a manner that the patient will be willing to pay a fee in compensation for the work done. Otherwise, a man will soon become discouraged and not carry out the technic necessary to get results, in which case his patients will say oral prophylaxis is not a success.

One of the first things to show a patient is the mass of fermenting substance on his teeth and teach him that tooth surfaces are one of the best bacterial incubators in the body and that all forms of micro-organisms can be found there. Hand him a mirror and let him see the surfaces of his teeth when painted with an iodine disclosing solution. Rinse the mouth immediately. Any discolored places should be polished until the disclosing solution finds nothing more to stain. It adheres only to foreign substances, and not to polished tooth surfaces.

Points, of two different shapes, held in Porte polishers, are necessary in a prophylaxis treatment. First, a broad, flat point to polish the distal surfaces of the last molars and buccal and lingual surfaces of the outer teeth, and second, a thin, sharp point to reach the interproximal surfaces near the points of contact. Dental tape is the only means of polishing one of the most vulnerable and inaccessible places, i.e., just gingivally to the contact point and its immediate vicinity. After we have gone over the teeth once, we should use the disclosing solution again, to make sure that all surfaces are clean. Of course, any substance which is not readily dislodged with a wooden point and fine abrasive should be removed with planes, scalers or files and the surfaces highly polished. I use nothing coarser than XXX silex in my prophylaxis work, because the coarser grits put scratches in the enamel, and these scratches are hard to polish out. It is well to put the most brilliant polish possible on the tooth surfaces, because a high polish prevents, in a measure, the adherence of foreign substances. For this high polishing I use Carmi-Lustro, tin oxid or rouge.

A great many cases of gingivitis are caused by the roughness of etched or improperly-developed enamel surfaces. Wherever these

imperfections are present, they should be planed, filed or ground and then polished to a smooth, brilliant surface, for no patient can keep a rough surface clean. Slightly etched surfaces are detected only by careful hand polishing, aided by the use of the disclosing solution. Always explain to patients that if such surfaces are left, they will result in cavities, which will cost more money to fill than a prophylaxis treatment costs, and that a filled tooth is not nearly as valuable as a sound one.

Patients should be taught to handle the tooth brush properly and to use it after every meal, but even this will not keep the teeth clean. Within from three to six days after a prophylaxis treatment, the tongue will discover little rough patches, and the disclosing solution will verify the discoveries of the tongue.

Most of my patients rub their teeth and the mucous membrane of the cheeks and palate, and massage their gums with rolls of cotton held in a suitable holder. A haemostat or a kuroris makes a very suitable instrument for holding these cotton rolls. In addition to the tooth brush, cotton roll holder and tape, patients are provided with polishers and points. Seventy-five per cent. of my patients have become quite proficient in handling these wooden points. I ask them to go over their own teeth twice a week. Many of them use the disclosing solution, and are able to get their teeth clean. Some patients may go for a year without a prophylaxis treatment, and yet, when they present themselves, their teeth are perfectly free from any kind of deposit. Others have to be seen every three or four months, and some every thirty days. Where patients are using the polishers, cotton rolls, dental floss and tooth brush, there is no definite rule for determining the periods of treatment. This must be gauged by the length of time they are able to keep their own mouths in a cleanly condition. The only way to tell definitely whether or not there is foreign substance on the teeth is to use the disclosing solution.

The only time a dental engine should be used in prophylaxis work is when it is necessary to grind cusps which malocclude, or to more quickly polish roughened or etched surfaces. When these places are sensitive, a forty per cent. solution of silver nitrate should be applied where discoloration is not objectionable, as on the back teeth; otherwise, a ten per cent. solution should be used. This stains only where decalcification has actually taken place. Deliquescent zinc chlorid or a saturated solution of potassium carbonate in glycerine helps to reduce sensitiveness to thermal changes and does not discolor the teeth, but causes considerable pain for about thirty seconds. Zinc chlorid should not be allowed to spread over the soft tissues, for it is an escharotic and causes soreness and sloughing.

The hand polisher and wooden points are preferable in subsequent treatments, because a revolving disc does the most wearing and polishing just exactly where the tooth brush and cotton rolls keep the

teeth the cleanest. Also, if the revolving disc and brush wheel are allowed to touch the gums, they cut them, making places for the entrance of pathogenic bacteria, and the tissues, in healing, form scars which always contract, thus starting recession of the gums. Sometimes we see gum tissue which presents a dull pink color, thickened margins and a mottled leathery surface, with little if any capillary circulation. I think this is a sort of callous which nature has produced to protect the tissue from infection when abused by a tooth brush, just as a callous will form on the hand from hard work. It is very hard to make vapor penetrate this tissue, and sometimes it is not possible to get it in until the third or fourth treatment, but if vigorous brushing is stopped and the vapor treatments kept up, the callous tissue will gradually disappear, and tissue which has a good circulation will take its place.

Realizing the pathological conditions which result from neglected mouths, it ought not to bother any one to convince intelligent patients that a modern, up-to-date dentist is striving for much greater results than merely that of saving teeth by repair work, and he should have no trouble in introducing oral prophylaxis into his practice and obtaining a fee which would compensate him for devoting the necessary time to accomplish good results.

Frequently patients say they realize these things, but when they get away from the office they procrastinate or forget altogether. They should be informed that we keep a regular "call up list" for reminding patients when they are due for their prophylaxis treatments. I keep a card system for this, a box containing monthly index cards, i.e., cards bearing the names of the months, also some small cards, about the size of a calling card, for the names of the patients. Each patient's card gives the period between treatments, i.e., "one month," "two months," "three months," etc. If a case is finished in January and you wish to see the patient in thirty days, his card is put in the February space. At the beginning of February, all the cards are taken out of the February space, appointments made, and the cards are distributed in the index box again according to period designated, i.e., the cards marked "one month" are put in the March space, the cards marked "two months" are put into the April space, and so on. The first of each month all the cards in the space for that month are taken out, appointments made and the cards re-distributed, and so on through the entire year. This system has several advantages. It enables the dentist to take better care of his patients, holds his practice together, and if he has taken an extended vacation, it gives him a list of patients to call up as soon as he returns.

It is well to get to working for children before they have cavities or have ever suffered dental pain, if it is possible. Also discourage parents or grown people from discussing painful dental operations before children. Above all, never tell a child a wrong story. If it

becomes necessary to do work which will be painful, call upon the child's manhood or womanhood to stand what is necessary, and then do the work as gently and quickly as you possibly can.

There are a number of methods of alleviating pain, such as analgesia, conductive anesthesia, novocain injections into the peridental membrane, etc., and they all save pain and help to build up a practice. Temp, carboleugenol or eugenol and zinc oxid, incorporated with cotton, can be used for a temporary filling. Any one of these dressings stops the pain, arrests decay, separates the teeth and crowds the gums back so that we can get at the gingival margin of the cavity, and a week or two later a permanent filling can be inserted less painfully for the little patient.

Farewell Dinner to Major Corrigan

W. E. WILLMOTT, D.D.S., TORONTO.

AN evening of real pleasure and profit was enjoyed by a number of Toronto dentists, when they met for dinner at the National Club, to bid farewell to Major C. A. Corrigan, D.S.O., on the occasion of his return to the front. Major Corrigan had been home on furlough to recuperate after being severely wounded while on duty in France. The close and earnest attention of everyone present for over two hours indicated the interest his hearers took in his experiences as a soldier on active service.

The first troop train, out of Toronto, in the fall of 1914, conveyed Lieut. Corrigan and his comrades of the C.A.S.C., to Valcartier, where a strenuous six weeks was spent previous to embarkation for England. It was just three years that evening, October 3rd, since the first contingent sailed out of Gaspe Bay, where the transports and convoys had mobilized. It must have been an inspiring sight to witness the thirty-nine transports and six convoys pass out of the bay in single file and then form up in three lines with the convoys on either side—which formation was retained until the shores of England were sighted and the steamers passed into the picturesque harbor of Plymouth. The Major's description of the stay at Salisbury in the rain and mud was especially interesting and increased more than ever, if that were possible, one's deep regard for, and confidence in the valor of the men of that first contingent, comparatively few of whom, unfortunately, are now on active service.

The trip to France, landing in the Bay of Biscay; then up to the front; the experiences of St. Julien, Ypres, Festubert, the Somme, etc., were very enthralling and produced an entirely new conception of the activities of our troops. When one considers that at the first battle of St. Julien, when the Canadians "blocked the road to

Calais," they had only one gun which fired a 6-inch shell or larger, and it only fired once every five minutes for one day, and that for twenty-five days previous to "Vimy Ridge," less than 60 per cent. of the available artillery sent over to "Fritz" between twenty-five and thirty thousand shells each day, one is almost appalled at the enormous amount of work accomplished by the Munitions Board. The name of Canada will ever be associated with the checking of the Huns on their dash for the seaboard. It seems almost miraculous that such a small force could succeed in saving the situation as the Canadians did on that occasion.

While the discipline and conduct of the Canadians were above reproach, still occasionally one or two would come back to camp a "little under the weather" as was evidenced on one occasion when three eastern men returning from the canteen halted in front of the Major's tent and one cried, "Shree Sh-e-ar-s for Ma-asher Corrigan," which were heartily given, then another called for "Shree Shears for Nova Schoshia," which were responded to, then the third, not to be outdone by the patriotism of the other for his native province, called for "Shree She-ars (hic) fer Shint Bruns (hic) New Shons Wick."

The visit to the German dug-outs, thirty to fifty feet underground, large enough to house a battalion and elaborately and comfortably furnished, showed the extravagance and comfort lavished on their troops, by the German authorities, in the early days of the struggle.

A description of the roads and intervening country very vividly portrayed the enormous difficulties experienced by the Service Corps in getting supplies and ammunition forward, and raised the admiration and regard of all for the efficient organization which could accomplish such a prodigious feat.

Major Corrigan was wounded by a bomb from an aeroplane, bursting in the second hut from his, the metal passing through the walls of that hut, the next one and his own before "getting" him. He paid a great tribute to the A.M.C. for its wonderful and effective work in caring for the wounded. While not identified with the Dental Corps, he knew of the incalculable value of its work and mentioned several officers whom he had visited and found very busy and very highly esteemed by the officers of other units.

The whole address was interspersed with amusing and interesting anecdotes which came under the Major's personal notice.

ALUMINUM CLASPS.—Teeth embraced by gold clasps undoubtedly, sooner or later, show signs of decay. After many experiments we have resolved to always use aluminum clasps in future. Upon examination of teeth upon which aluminum clasps have been encircled for some considerable time, we have quite failed to find the slightest sign of decay or erosion.

THE COMPENDIUM

This Department is Edited by
THOMAS COWLING, D.D.S., Toronto

A SYNOPSIS OF CURRENT LITERATURE RELATING
TO THE SCIENCE AND PRACTICE OF DENTISTRY

ANCHORAGE OF ALLOY FILLINGS.

THERE are many dentists who still prefer a filling that has carefully finished margins, to any form of crown as a means of restoring badly decayed teeth. The danger of irritation from poorly fitted bands of crowns is still imminent, although much has been accomplished towards its elimination as a result of the publicity given to the treatment of pyorrhoea and allied ailments. For those of us who would avoid using crowns as a means of restoration, the question is, how shall we secure suitable anchorage for a filling in a very badly decayed tooth. The methods of retention taught by most operators fail to meet the requirements in many cases and other means must be devised.

Treatment of this question is given in a paper published in August number of "Cosmos," by Dr. W. S. Payson, of Castine, Me., to which the reader is referred for descriptive diagrams, etc. of the author's methods. Dr. Payson states that his method of retention has been tested out for many years with excellent results. He has been able to insert fillings and keep them in position in many cases where other operators using other methods have failed. When preparing a badly decayed tooth for a filling, the least possible amount of tooth tissue should be sacrificed. To conserve the maximum amount of tooth tissue, is the objective. In the author's opinion the three main purposes of a filling are: "(1) to stop decay, (2) to serve as a part of the masticatory surface, and (3) which is not the least, to protect the gums at the interproximal space." This last requirement is obtained by contouring the filling to the original shape of the tooth, having the filling touch the adjoining tooth with a rounding, smooth surface about one-third the distance from the morsal surface to the gingival portion, in order to prevent fibrous foods from wedging into the interproximal space and impinging on the gums.

The method for securing retention of a filling is best described in the author's own words. He says: "A large approximal cavity in a bicuspid should have the decay removed, leaving all the dentine possible for support on the buccal and lingual surfaces, with a step at

the gingival portion and with the sulcus leading from the cavity cut out not wider nor deeper than the diameter of a 15-gauge wire, unless decay compels a more extensive cutting. The portion of the sulcus farthest from the cavity should be made sufficiently large to receive one head of a double-headed rivet, the sulcus serving as the anchorage for the filling, and the rivet keeping this small mass of the filling from breaking away, and the other head of the rivet being embedded in the filling proper after the manner of reinforced concrete." The rivets used may be made of hand-drawn brass wire about 23-gauge or smaller. Should there be indications of great stress on a filling, then rivets of 21-gauge wire had better be used. By referring to the complete report of Dr. Payson's paper, the reader will learn of his methods as applied to the treatment of molars.

In addition to giving added strength to a filling, the use of these rivets permit of easy repairs being made should decay recur on the buccal, palatal or gingival surfaces. The original filling need not be disturbed because the anchorage is not involved as would be the case in a filling inserted under the ordinary methods of retention.

Dr. Payson favors the lining of all large cavities with any phosphate cement in order to protect the pulp and to retain the color of the tooth. The cement should be put in the cavity before the matrix is adjusted about the tooth. Pressing home the liquid cement with a plug of unvulcanized rubber is suggested as a good method for lining all the walls and avoiding air-spaces. The rubber is kept pressed against the cement until hardening begins.

Good results, as regards condensation and contouring of a filling can only be obtained by the use of a matrix. Dr. Payson suggests the use of very thin, soft steel (No. 36), for this purpose. The steel is cut into "a dozen or more pieces of different lengths and widths, with a smooth hole in each end for the reception of a ligature and with the gum edges of the matrices rounded at the corners. These can be used over and over again after passing them through the flame to sterilize." Dealing particularly with the method of using the matrix, Dr. Payson says: "To me a ligature of large waxed floss silk used in connection with a very narrow wedge close to the gum, is the best method of holding the matrix in place. To use the ligature, I take a one-foot length and thread one end through the hole in the matrix that comes on the palatal side of the tooth, tie at the middle of the ligature, then put the other end of the ligature through the other end of the matrix. The matrix is now slipped into place with the two ends of the ligature passed around the opposite sides of the tooth and tied, bringing the knot on the buccal side, then slip in the narrow wedge close to the gum. I then tie the ligature several turns around the matrix and tooth, tying with a surgeon's knot each time." A detailed account of a method of mixing the amalgam and carrying same to the cavity, is given. Many valuable

hints are embodied in this report and the reader is advised to review Dr. Payson's complete paper.

MISTAKES IN ROOT-CANAL WORK.

Dr. William A. Spring, gives us, in August "Cosmos" an account of the difficulties encountered and the disclosures likely to be made when operating upon root-canals under the present method of X-ray examination. He says in part: "The purchase of an X-ray machine and the exposure to my vision of what I was doing, and what I was failing to do, and my conscientious endeavor to conquer, has given me the hardest year of my professional life, and in the beginning my shame and chagrin over an incomplete filling, especially in a straight canal, would have been followed by actual discouragement had not experienced radiographers informed me that they often had to fill roots a second time." No doubt such an experience has been shared by many others. However, the accomplishment of satisfactory root-canal work is an achievement well worthy of our best efforts.

Dr. Spring enumerates some of the difficulties or mistakes that one is apt to encounter when attempting the treatment of root-canals. He says: "The first mistake is attempting to do any canal work without properly isolating the tooth with the rubber dam. How often we recall teeth which were perfectly comfortable until opened, and from that moment were tender and troublesome. Since using the dam for each case, I am spared that experience, and yet I have discarded my custom of leaving every devitalized tooth open for at least twenty-four hours."

It is suggested that the gums be painted with a mixture of iodine crystals in benzine to which has been added 20 per cent. of menthol. Such treatment is said to both disinfect and prevent sensation. Its use is particularly applicable before inserting the hypodermic needle into the tissue.

The second error enumerated by the author is the failure to open the crown of the tooth sufficiently to gain access to the pulp chamber and so secure easy approach to the root canals. Openings in direct line with the canals must be established. He says: "Direction to the canal opening having been secured, it is sometimes necessary to ream with the drill one side of the canal to get direction for the deeper part, but this should be done with great caution, and only with radiographic proof of the side to be reamed." The use of the engine drill in reaming is not deemed advisable because of the following possibilities of doing harm: "(1) one loses the sense of touch; the guiding walls are gone which might lead a probe or a Kerr file to a continuation of the canal; (2) chips from the reamer may so block the canal as to make it almost impossible to proceed, and to convince one who has not an X-ray proof, and especially one who does not count as regular procedure, the finding of the apical for-

men, that the end of the canal has been reached; (3) The reamer may start a false lead. In the hands of the careless it may plunge through the side of the root, but even in the hands of the most careful it can easily go too far. If at some bend the point makes a depression to the fraction of a millimetre, everything else from that moment seems attracted to that small pit as to a magnet, and further progress is difficult. Undoubtedly many operators, who do not prove their progress with the picture, and who do not attempt to find and fill the foramen accept such a preparation as complete and fill to that point, leaving the balance uncared for; (4) Reamers of large calibre may so thin the root as to render it very frail."

The use of arsenic is, in the author's opinion, uncalled for in devitalizing pulps. Conducting the anesthesia by the Fischer method being the favored practice. In making a painless exposure of the pulp, a seven-minute application of cataphoresis is said to be of great aid. The filling of a root-canal immediately after the removal of the pulp is not deemed a wise procedure by Dr. Spring. He uses no adrenalin, preferring free bleeding. After that has ceased he removes the clots with paper points, and wipes out the canal with hydrogen dioxide. In this connection he says: "If the first operation removes all the pulp and fine probes pass through the foramen, I leave a paper point or a simple dressing in the canal and fill at the next sitting. If the fine probes do not pass through the first time, the next operation consists in getting them through, at which time sodium-potassium may be used."

It is a mistake to use any pressure on the contents of a root canal if any part of same is thought to be putrescent, because of the grave danger of forcing some of the material through the foramen. If putrescent material has to be removed, the use of a fine broach is recommended for this purpose. "As soon as enough material is removed to establish a good opening," says Dr. Spring. "I consider it correct to use sodium-potassium to render negative the remaining contents as soon as possible. This can be neutralized from time to time with Marchand's hydrogen dioxide which is somewhat acid. Particular care must be taken to thoroughly neutralize, at the end of each sitting, any powerful agent that has been used while operating upon the canal. For instance, if sodium-potassium has been inserted in the roots, then use 40 per cent. sulphuric acid and neutralize it with sodium bicarbonate.

Taking up the question of the advisability or inadvisability of using strong drugs in root canals. Dr. Spring says: "I have ceased sealing drugs in the canals, but instead use a paper point or sometimes a dressing recommended by Dr. Buckley, consisting of menthol 2 grams, thymol 3 grams, and Merck's eucalyptal 1 fluid gram. I do not criticize as wrong, the use of formo cresol, but it should not be carried well into a canal unless the operator has successfully blocked off the

canal with chips from reaming. The originator recommended its use in the pulp chamber before the contents of the canal had been removed, and that is certainly all right."

The treatment of root canals that have been closed through calcification requires an unusual amount of patience, and still otherwise the root will be perforated in the attempt at clearing a passage. To attempt the filling of a calcified root-canal "where the radiograph shows no bone rarefaction at the apex" is a mistake. This warning, however, is given: "It is wrong to jump to the conclusion that a root is filled with calcified material just because one cannot easily enter it. I have frequently worked more than an hour on a seemingly solid canal and have been rewarded in the end by finding a good opening and a good lead. Secondary, dentine from a receding pulp may obstruct our passage and we must pass through it for some distance before we have a right to assume that there is no open canal beyond."

We are advised against believing that we have reached the apex when sometimes the canal is blocked with chips or other material. Living pulp tissue may be beyond the obstruction and must be reached.

The use of the X-ray has served to prove conclusively, the futility of attempting to fill root-canals with a single dry cone. A solution of some sort used in conjunction with the cone or with cones is the best method. If the solution be of gutta-percha, then it should not be too thick, otherwise it will block the way, or in roots with large apical foramina, it may be pushed through by the points. It is best not to attempt to fill a canal with one cone only, but use as many as can be accommodated in the space.

THE UPPER THIRD MOLAR—THE NECESSITY FOR ITS REMOVAL.

Few dental text books pay due attention to the treatment of the upper third molar, although experience has taught most of us that this tooth deserves more than passing mention. It is also a noticeable fact that this subject has rarely been chosen by essayists or lecturers as a suitable one for presentation at dental meetings. It is with especial interest then that we read the very able discussion of this subject given in August "Summary," by Paul Cassidy, A.B., D.D.S.:

In brief, Dr. Cassidy favors the extraction of the upper third molar in all cases because its demerits do, in his opinion, vastly outnumber its good qualities. At the first glance such an attitude may appear strange, if not, indeed, at variance with common conception of good practice, but the author deals decisively with this problem in the opening paragraph of his paper. He says: "No serious consideration of dentistry can be made without the recognition of the fact that the two highest offices, or prerogatives at least, of the modern dentist are destruction and prevention. These two are linked finally in one—prevention. For it is only for the alleviation of exist-

ing troubles that destruction of tissues and organs become for us, not a privilege, but a mandate." In the interests of good dentistry Dr. Cassidy advocates the destruction of the upper third molar at the earliest possible moment because among other reasons it is "an unclean and uncomfortable member of the dental collection, interfering in a large measure with the proper masticatory movements of the lower jaw." It has also a very considerable influence upon the eruption and final placement of the lower third molar.

A brief life history of this tooth is in order. It appears usually at about the eighteenth year. In the female its appearance is earlier than in the male. A difference as great as two years is noticeable sometimes. It is placed in the most vascular bone contained in either maxillae. Dr. Cassidy refers to "the ease with which infectious matter may be carried into the general blood stream from its situation."

There is great difficulty, except in abnormal mouths, in keeping the surfaces of the upper third molar properly cleansed. The buccal surfaces are particularly difficult to reach because "upon opening the mouth widely the buccal mucosa is pressed tightly against the upper third molar, when this tooth is in position, by the coronoid process of the lower jaw. This makes the complete insertion of the brush an impossible task." For this reason the tooth is rendered susceptible to early attack by caries. The pulp is soon involved and chronic suppurative periostitis follows, "which on account of the type of the bone surrounding the tooth, is rarely accompanied by considerable pain manifestations and seldom develops into an acute abscess. This sequence is far more injurious to the general health of the surrounding tissues, and to that of the body itself, than were the tendency in the other direction."

There is also danger of this condition becoming an infection of the maxillary sinus and radical operations may be necessitated. Few text books on dentistry or anatomy recognize the fact that the posterior floor of the sinus not infrequently dips down sufficiently far to include a portion of the roots of the upper third molar.

Addressing his remarks to orthodontists, Dr. Cassidy points out that they ought to give more thought to this tooth than has been the common custom heretofore, otherwise the results of their careful and skillful labor may be upset. 'Tis true that orthodontists have to do almost entirely with young patients in whose mouths the third molars have not erupted, but the author contends, they must when rearranging the arch, anticipate the arrival of the third molar. If this is not done the whole line of the arch may be roughly disarranged.

Another point against this tooth is that when fully erupted, it prevents the proper incising motions of the anterior teeth. When this tooth is in position, its disto-buccal cusps will invariably come into contact with the soft tissue overlying the ramus of the lower jaw. Pain and incomplete function results. This is particularly the case

when the upper third molar is in position for some time previous to the arrival of the lower third molar.

The upper third molar has a tendency to elongate and limits the movements of the lower jaw. The tendency is to restrict the movement to that of a vertical line.

Perhaps the most serious objection to this tooth is the fact that it may cause the imperfect eruption of the lower third molar and give rise to that serious condition known as "impacted teeth." The reader is strongly urged to read Dr. Cassidy's account of the events leading up to this condition. He clearly points out how the upper tooth by reason of its being in position first and being usually elongated, may cause the lower tooth to erupt out of its true position by reason of the pressure exerted by the inclined planes of the cusps on the upper tooth. His paper is full of interest for those who would go fully into this subject and will well repay a careful perusal.

Correspondence

France, Sept. 4th, 1917.

Oral Health,
Toronto, Canada.

Dear Mr. Editor:—

Have been receiving of late an occasional copy of "Oral Health," which is like a breath from another and distant atmosphere, and takes one back to the old civilian days. I simply wish to express my appreciation of your courtesy in sending the copies of your publication to me, and to give you an alteration in my army address as noted in your list of the July issue. My unit is now the 1st Canadian Infantry Battalion, instead of L. S. H. Reserve.

I hope, if spared to return to my Saskatchewan home after the war, to be able to make more professional use of your valuable publication. We see the need of dental treatment very clearly here, and I am able on many occasions, as a combatant officer, to facilitate the men getting C. A. D. C. treatment.

Wishing you every success,

I remain yours sincerely,

G. L. CAMERON, MAJOR
1st Battalion, Canadians.

TO REMOVE RUBBER FROM DIATORIC TEETH.—Diatoric teeth are often broken in removing the rubber from the holes. It may be easily and safely done by putting the teeth in a small bottle and covering them with strong nitric acid, and letting stand for a day or more. Warning: This method should not be used with teeth having base-metal pins.—*D. W. Barker, Dental D.*

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Complimentary copies of ORAL HEALTH will be sent during the progress of the war to all Dental Graduates on active service whose army address is known.

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of CANADIAN DENTISTS

ORAL HEALTH will appreciate receiving names and addresses or other information that will make these pages a complete Army Service Directory constantly available to every member of the profession.

CANADIAN ARMY DENTAL CORPS—OVERSEAS.—(Continued.)

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(Continued on next page)

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(Continued)

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PRO BONO PUBLICO

This Department is edited by FRED J. CONBOY, D.D.S., and will contain dental information in a form suitable for publication in the public press.

Members of the profession are urged to arrange, from time to time, for the insertion in a local paper, of the material appearing upon this page.

A Railroad Magnate's Failure

ONE of the greatest railroad magnates that this world has ever known died from a malady directly traceable to a diseased condition of the teeth. He had paid careful and constant attention to every detail of his great business enterprises, but had sadly neglected the great essential to good health, with the result that his business lived and thrived long after he had ceased to exist. And there are many in a similar position to-day; they are either ignorant or neglectful of the fact that they cannot continue to enjoy good health if their mouths are in an unhealthy or diseased condition. Experience has taught them that decayed teeth may cause great pain and suffering with a consequent loss of time and efficiency, but they do not clearly realize how detrimental to their physical welfare this condition really is. Good teeth are necessary for the proper mastication of food, without which there cannot be perfect digestion, impaired digestion soon results in poor health, lowers the vital resistance and therefore, makes the individual more susceptible to disease. In addition the mouth is a veritable breeding place for disease germs, the growth of which is much aided by the presence of decayed teeth. So that sound teeth and a clean, healthy mouth are absolutely necessary to lessen the liability of contracting infectious and contagious diseases. Then, again, bacteria and toxins (poisons), coming from areas of infection at the roots of teeth and from pyorrhea, are taken up by the blood stream and cause secondary infection in other parts of the body. It has been definitely proven that many cases of disease of the joints (rheumatism) nervous system, heart, kidneys and blood have been occasioned by these primary infections. Abscesses draining into the mouth and pyorrhea pockets discharge pus into the oral cavity, where it mingles with the fluids of the mouth and when swallowed reaches the stomach and intestines. The persisting infection through this channel gives rise to most serious disease of the lining membrane of the alimentary canal. Diseased conditions of the oral cavity if allowed to exist for a sufficient length of time are sure to prove disastrous to your health, *therefore watch your teeth.*

Clippings From the Daily Press

DENTISTS TO DO THEIR BIT.

COLLEGE CONSCRIPTION.

Freshmen Divided Into "Fit" and "Unfit" Classes—"Fit" Serve as Sergeants.

FRESHMEN who registered at the Dental College this year did so upon the understanding that they would be examined at the Armouries, and if found "physically fit" would serve as sergeants in the Canadian Army Dental Corps when required. A special sergeants' class will be organized, composed only of "fit" men in preparation for Army Dental Service. The army rejects will be permitted to proceed with the regular dental course.

STARTED LAST SPRING.

Though this policy was announced by the Dental College last April (before the National Service Act was announced), quite a number of candidates were unaware of the regulations, but for the most part were quite in accord with this form of conscription.

There were some exceptions. One applicant, who departed with the remark that "he was not aware that the Dental College had been turned into a recruiting office," failed entirely to grasp the situation. The whole plan, of course, assumed that any young Canadian entering upon the study of dentistry to-day, should, no matter what his age, undertake to serve in the Dental Corps, if and when his services are required.

It is to the dental colleges that the militia authorities must now look for further recruits trained as dental assistants. It takes time to properly train men for this special work, and the needs of the future must be anticipated to-day and adequate preparations made in advance to meet them.

SAVED MILITARY SCHOOL.

The colleges have placed their organization at the disposal of the Government early in the war, for the purpose of not only securing men, but training them for service in the Canadian Army Dental Corps. This action saved the Government thousands of dollars by obviating the necessity for a Military Dental School in Ottawa, as had been planned. In addition to the regular dental students who have enlisted, from time to time, the college has conducted two sergeants' classes and a special summer session. The latter was held for the purpose of advancing the instruction of the senior students that they might be available either for the C.A.D.C., or to take the place of more experienced dentists who had enlisted.

SPECIAL CONCESSIONS.

Students who give twelve months or more of satisfactory dental

service are advanced one academic year in their course. Certain concessions, in the matter of matriculation standing, have also been granted those students who enlist. Every effort of this kind of returning the boys who are doing their bit back to civil life after the war, with as little handicap as possible, is a move in the right direction. ^

USED BY FLYING MEN.

During the past summer the college building was placed at the disposal of the militia for the conduct of a clinic where the dental needs of the Flying Corps' members were attended to. This clinic was organized as part of the dental service in Military District No. 2. The Dental Corps in this district is administered by Major W. G. Thompson, A.D.D.S., who has his office at Camp Borden. *Toronto Telegram.*

GUNNER AND DENTIST.

VICTOR SPEER TREATS MEN WITH CAPTURED GERMAN INSTRUMENTS.

THE men in the trenches are well looked after in the matter of medical treatment, but the need for dentists is shown by the efforts of a Toronto boy, Gunner Victor Speer, son of Rev. Dr. J. C. Speer, to carry on a little needed dentistry when his fellow gunners have a spell off the guns.

His appliances were captured from the Germans, which shows that they are looking after the dental needs of troops at the front, while the Canadians are without such attention.

Victor Douglas Speer finished his second year in the Royal College of Dental Surgeons in the spring of 1916, and immediately enlisted in the University Battery, and on the 15th of June left Toronto for overseas. He trained in England until November the first, when he, having passed his examinations as gunner, was sent forward to the firing line in France. He was wounded on November 10th, and in ten days he was back again on the line of battle, where he has remained ever since. He has had his full part of the hardships incident to a winter on the French fields.

Some time last spring, the Germans having been driven back, the boys secured a German Red Cross dug-out, in which they found, among other things left behind, a complete set of dental instruments. It was evident that right on the edge of battle the enemy was busy keeping the men efficient and free from the malady of "trench mouth" and tooth agony. Gunner Speer at once purchased the instruments, and since then he has gained quite a reputation as a dental surgeon among the boys. Of course his work is all done without any fee or reward, save the joy of being able to relieve the comrade of untold agony, and thus add to the efficiency of his battery. His time is taken from his regular rest, and often from his hours of sleep, but that is the spirit of the army.—*Toronto Telegram.*

ORAL HEALTH

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Vol. VII.

TORONTO, OCTOBER, 1917

No. 10

EDITORIAL

Canadian Dental Services Overseas

AN interesting controversy has arisen by the publication, in prominent Canadian daily papers, of complaints regarding the condition of the teeth of returned soldiers, owing to the lack of Canadian dentists in France. As a matter of fact, only forty members of the Canadian Army Dental Corps, are at present stationed in France, the services of the other members of the corps being used in the hospitals and camps of England and Canada. The public protest was made, following the transfer of a dozen or so members of the C. A. D. C. from England to Canada, and the question was asked: "Why were these Canadian Dental Officers not permitted to follow the Canadian troops over to France, as they desired?" The difficulty appears to be a lack of co-operation, the responsibility lying somewhere in England or France.

There is no question as to the magnificent service being rendered the troops by the C. A. D. C., but the authorities seem to have missed the point, namely, that after the Canadian soldier has been made dentally fit, sufficient dentists are not sent forward to keep the teeth of the men in a proper condition.

The following appeared in a recent issue of "The Ottawa Jour-

nal," under the heading "Better Dentistry Needed at the Front—Returned Men Complain of Some Red Tape Methods:"

"Satisfaction with the condition of the teeth of returned Canadian soldiers and with the treatment they received while overseas, is not universal.

"There is a difference between English and Canadian dentists and it was the subject of vigorous discussion among returned soldiers this morning. 'The dental services in the army will have to be materially increased if proper dental service is to be given the hundred thousand men composing the first class to be called to the colors under the Military Service Act,' declared one speaker.

"The lamentable condition of the teeth of some of the returned Canadians would also indicate that there will have to be some further effort made to give the boys at the front better dental attention.

"Unfortunately, through some misunderstanding, many of the Canadian dentists have not been permitted to follow the troops over to France. This is an astounding state of affairs, when one considers the prevalence of both trench mouth and dental disease. The Canadian dentists could prevent much of this trouble and relieve a great deal of the suffering of the men. It is a well known fact that the physical welfare of the troops depends in no small degree upon the condition of their teeth.

"Why should hundreds of Canadian soldiers be incapacitated in this way and returned to the base for treatment, when the presence of a Canadian dentist attached to each Canadian battalion would entirely overcome the difficulty? This is the question that many of the returned men are asking."

The Toronto Mail and Empire published the following Government statement a few days later:—

"The Militia Department has issued a positive denial to the statement, which appeared in the press some days ago, that the Canadian forces in France are inadequately supplied with dentists and that much suffering has been caused to the men because of this. On the contrary, it is stated at the Department that the Canadian dental corps overseas which now consists of 250 officers and 549 warrant officers, n.c.o.'s and men is a most efficient organization and has done work of the greatest value, especially in combatting the disease known as trench mouth. The research of the Canadian dentists in connection with evolving a cure for this disease has, it is stated, proven most important not only to the Dominion forces, but to the whole British army.

"With reference to the allegation that there are not enough dentists attached to the Canadian forces actually in France the Militia Department issues the official information. Attached to each general hospital in France is one dental officer, one dental mechanical sergeant, and one dental orderly. The dental sergeants are a."

partially qualified dentists, able to handle the simpler kinds of dental operations. Each stationary hospital is equipped with a similar staff, as are all casualty clearing stations and field ambulances. Each corps laboratory has three dental officers, six sergeants, and six orderlies; and at the Canadian base there is a staff of three dental officers, three dental sergeants and five orderlies.

"In addition to the dental officers, n.c.o.'s and men on duty in France there are also those in England, many of whom are attached to the various hospitals. The number of these dentists is, of course, regulated by the number of patients which are handled by the hospital."

It is to be hoped that present conditions will be speedily remedied, that there may be more than forty members of the Canadian Army Dental Corps in France.

C.A.D.C. Favored by British Dentist

ORAL HEALTH is indebted to Captain H. C. Jeffrey for clipping from the London Daily Mail as follows:—

"Speaking at the meeting of the British Dental Association on Saturday, Mr. W. H. Dolamore, who was re-elected president, stated that over 1,100 dentists were now serving, some 40, with an equal number of dental students, having fallen in the war.

"He drew attention to the remarkable record of work accomplished by the Canadian Army Dental Corps, and suggested the advisability of a separate Army Dental Corps being instituted for the British Army as was the case with the Overseas Forces."

Officers Prince Edward Island Dental Association

AT the annual meeting of the Prince Edward Island Dental Association, held at Charlottetown, September 26th, 1917, the following officers were elected for the year 1917 and 1918:—

J. H. Ayers, D.D.S., President.

J. E. Blanchard, D.D.S., Vice-President.

J. S. Bagnall, D.D.S., Secretary-Treasurer, Registrar.

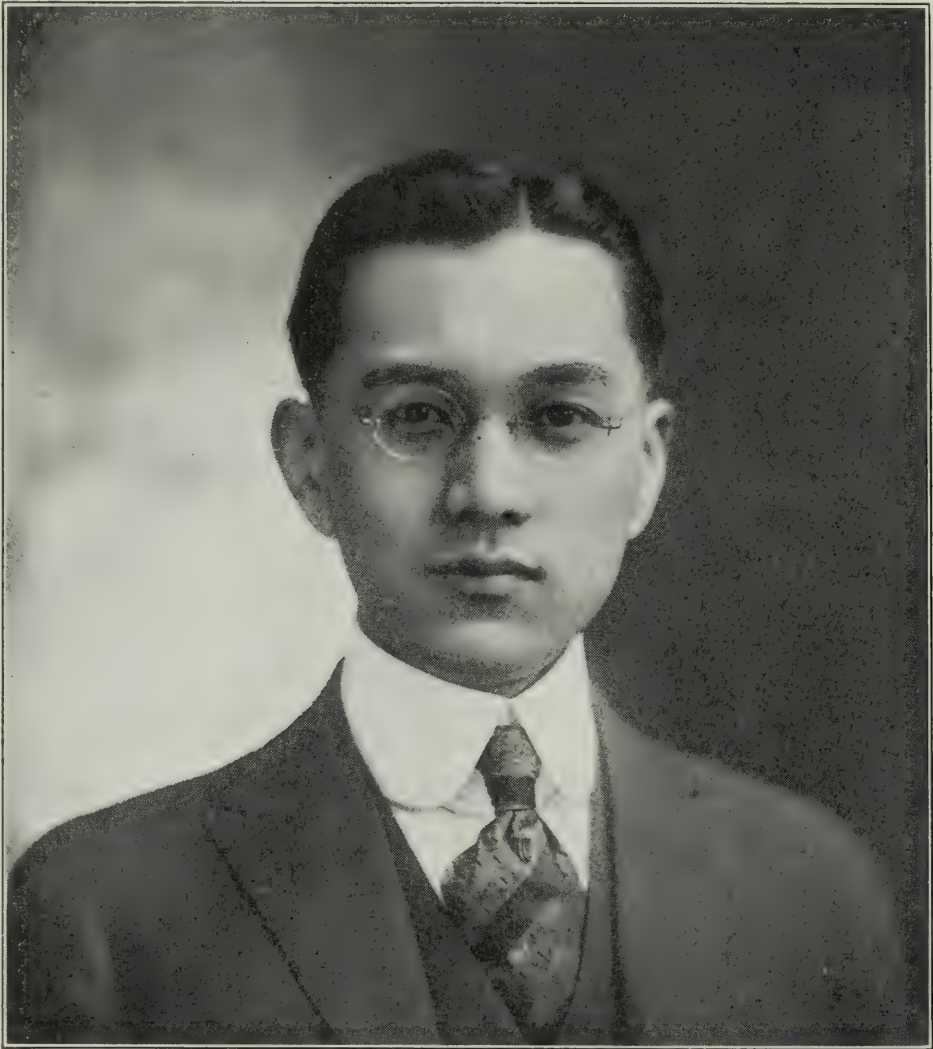
F. S. Lodge, D.D.S., and J. B. Brown, D.M.D., were elected to complete the Council.

Graduate Assistant

ORAL HEALTH will be glad to furnish name and address of graduate dentist who has returned from overseas and now desires to secure a position as assistant, preferably in a Toronto office.

A Real Secret

“WHO of us has not marvelled at the good cheer and optimism that mark the letters which come from our lads at the battle front? We marvel, but in reality we have no reason to, for there is a principle at work in that matter that has general application. You have noticed, surely, that the people who are most discouraged and hopeless about the sin and sorrow of the world are not the people who come into closest and most vital touch with its misery. In nine cases out of ten at least, the out-and-out pessimist in regard to this poor old sinning, suffering world of ours, is not the man who has his sleeves rolled up, and is tremendously busy at the task of making it better, but rather the man who, with arms folded, is spending most of his time merely looking on. There seems to be something positively vitalizing in work, and to get really at a task is to get hopeful about it. There is one sure cure for pessimism, and that is to get busy at the worth-while job that is before you.”



Hiroshi Kawamura, D.D.S.
Tokyo, Japan

"Oral Health" has pleasure in introducing to its readers Dr. Hiroshi Kawamura as having recently joined the group of associate editors of this magazine. Dr. Kawamura has had an active career as a practising dentist, associated with his father, Dr. Toshihiro Kawamura, who was president of the Japan National Dental Society, 1916, and member of the National Board of Dental Examiners, in Tokyo, Japan. As a member of the Histological and Pathological Department in the Tokyo Dental School, and in conjunction with Dr. K. Hanazawa, he has some original work of special note along the lines of the histological and pathological study of hereditary syphilis and relation to teeth. Dr. Kawamura is now engaged in a two years' post-graduate study embracing post-graduate work at the College of Dentistry, University of Illinois, Chicago, Royal College of Dental Surgeons, Toronto, Columbia University, New York, and other institutions, as well as special work with individual teachers, following which he will resume his teaching and professional duties in Tokyo, July, 1918.

The dental ideals and aims of our Japanese professional brothers are identical with those of our own, and it is expected that "Oral Health" will be favored from time to time with contributions from the pen of its newest associate editor.

ORAL HEALTH

A JOURNAL THAT STANDS FOR THE "OUNCE OF PREVENTION," AS WELL AS THE "POUND OF CURE"

VOL. 7

TORONTO, NOVEMBER, 1917

No. 11

Trench Mouth*

L. D. MACLAURIN, CAPTAIN C. A. D. C., BRAMSHOTT, HANTS, ENGLAND.

"TRENCH MOUTH," the name given to a disease very prevalent among our troops, the symptoms of which are well known, is to my mind a misnomer, and not only fails to convey any adequate idea of the true nature of this disease, but leads to faulty treatment.

This disease was not common in pre-war days among people where general hygiene and dietetics were carefully considered. Among our troops such conditions as the scarcity of well-balanced food, insufficient fresh vegetables, unhygienic living conditions, dampness, filthy mouth, due to neglect of use of tooth-brush, are responsible for the recurrence of diseases which were formerly known as scurvy and ulcerative stomatitis, diseases prevalent among people who lived under conditions similar to our soldiers of to-day. Like all inflammations of mucuous membranes the condition varies much in severity.

The general symptoms are a putrid sore mouth, swollen ulcerated gums, the ulcers covered as a rule with a greyish membrane, and in neglected cases necrosis of the alveolar process and loosening of the teeth sets in. Glands are frequently enlarged and constitutional disturbances are noticed. These symptoms and conditions of the patient lead one to suspect ulcerative stomatitis, and in a great number of cases I believe that is what it is. In the examination of at least 200 cases I have found conditions where the patient is weak, languid and drowsy with aching bones and joints, suggesting scurvy.

*Permission granted by Canadian Army Dental Corps authorities overseas, for publication in Oral Health.

Without going into discussion of the organisms of these diseases where opinions are as conflicting as in the case of pyorrhea, let us consider the results of the scientific diet given to the troops in England at present. Previous to this system of dieting the diseases above mentioned were very prevalent.

On July 25th, 1917, after a few months of this well-balanced diet I examined in the neighborhood of 1,250 men, and found but five cases of what is commonly known as trench mouth. These cases were so mild, were it not for the characteristic odor of the breath, it would have been impossible to have distinguished it from gingivitis.

At this season fresh fruits and vegetables are plentiful, and moreover there is evidence to show that men are beginning to appreciate the value of the tooth-brush. It was such careful attention which was directed to dietetics and sanitary conditions that practically eliminated scurvy and ulcerated stomatitis. To sum up, the causes are to be sought in a lack of well-balanced diet, unhygienic conditions of living and habits and certain depressing influences due to conditions which lower the power of resistance to disease.

TREATMENT.

In the treatment of approximately 200 cases, some of them of three months' standing, I found in all cases that the membranes completely healed, the teeth tightened, and all other symptoms disappeared.

GENERAL TREATMENT.

Curative measures are mainly dietetic and prophylactic treatment and general hygiene. Laxatives or purgatives are given when indicated, such as saline aperients. Diet should be well-balanced and should in the main consist of fresh milk and meat, potatoes and green vegetables and fresh fruits. A daily ration of substances, such as lime juice, lemon, sugar and vinegar is recommended. As a precaution to prevent spread of the disease a proper system of washing all mess utensils is imperative. At present common tubs are used.

LOCAL AND INTERNAL TREATMENT.

LOCAL.—All debris is removed from teeth and mucuous membranes with swab of cotton dipped in 70 per cent. alcohol. Calculus is removed from necks of teeth with sterilized Tompkin's Scalers, dipping the instruments in tincture of iodine, frequently when in use. All patches and sloughing are removed from the mucuous membrane by means of cotton dipped in solution of equal parts of *Beachwood*, *Creosote* and *Eucalyptol*. All membranes are then coated with this solution. Repeat daily until cured.

As a mouth wash use potassium permanganate tablets, grains II. to a glass of warm water and rinse mouth five or six times a day. Give internally:—

Pot. Iodide	℥iss
Liq. Arsenicalis	℥i
Aquae Ad	℥iii

Sig. Teaspoonful in water 3 times a day.

The combination of arsenic and iodine, being a tonic and alterative may aid in changing a morbid to a healthy condition. Free iodine is secreted in the mouth and may make the environment for organisms not the best; arsenic being specific for organisms of Vincent's angina.

The foregoing has been my treatment and has worked successfully in all cases.

The following prescription could be used to advantage in some cases where fruits and vegetables are not obtainable:—

Potassi Citratis	℥iv
Acidi Citrici	℥i
Ol. Limonis	vi gtts.
Alcoholis	℥iii
Caleii Glycerinophos	xii grs.
Aquae Qs. Ad.	℥vi

Sig. Tablespoonful in half pint of sweetened water to be used as a drink whenever thirsty.

In following out treatment the writer always insists on patient having fresh lemonade as frequently as possible each day.

Dental Service for Employees of a Great Industry

E. A. HARRINGTON, D.D.S., TORONTO.

(Dr. Harrington is in charge of the Dental Clinic recently organized by the T. Eaton Company, Limited, Toronto. This company has always been foremost in every movement which seeks to better the condition of the worker. This has been particularly apparent in the position of the company regarding shorter hours and improved working conditions. The profession generally will, doubtless, give the company loyal support in the establishment of a dental service for the purposes indicated by Dr. Harrington.—Editor.)

IN the business world to-day, the word "service" is probably heard more often than any other word. Modern enterprises place great emphasis on this feature of their business, and it, undoubtedly, makes for their success. A word closely related to service is "efficiency." In these progressive days, "efficiency" and "efficiency of service" are paramount; and success, whether it be of the individual or of a corporation, is truly measured by the service rendered, rather than by political or social distinction or financial accumulations. To produce efficiency of service, many plans and devices have been adopted, and no store or individual can serve well, unless constantly adopting those means which are calculated to, and do, produce efficiency. Consequently we see on every hand means and devices used to bring the individual as near perfection as possible. Not the least of these are those means which go to produce a physical con-

dition approaching perfection. We find in certain large corporations a department of "Welfare Work" to that end.

The T. Eaton Company has been among the foremost in the world in this line of endeavor. To their already large, generously and efficiently conducted, and rapidly developing welfare department, this company has recently added a dental clinic. It is not our purpose to summarize all that is being done in welfare work by

THE T. EATON CO. LIMITED
WELFARE DEPARTMENT

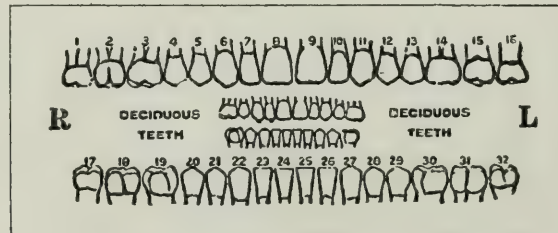
Toronto, Ont., _____ 191 _____

Dept. and No. _____

M _____

Address _____

Upon examination, the following conditions are found, and the suggestion is made that you visit your Dentist for treatment.

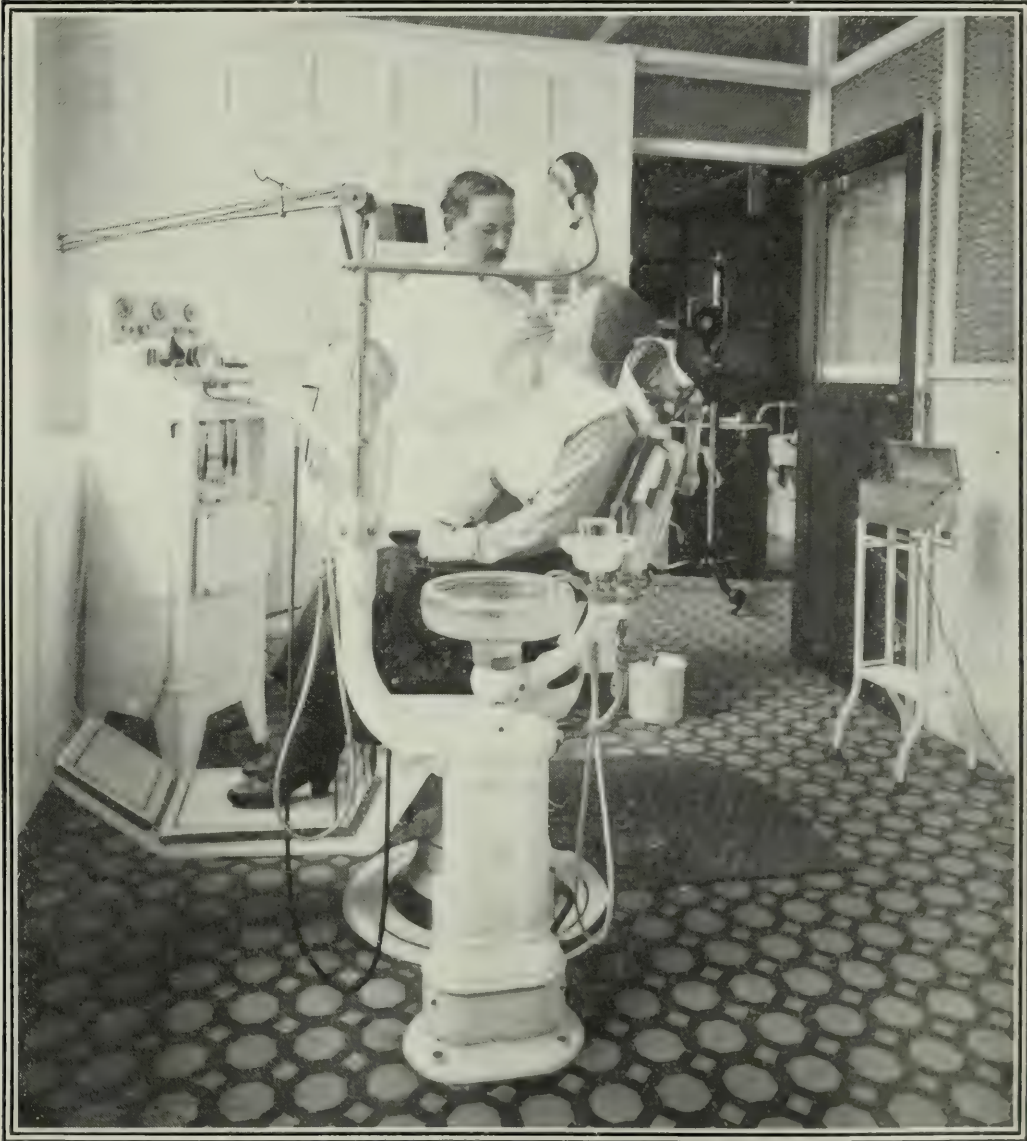


2981—11/6/17—500—Welfare

this company, but rather to dwell on that work which is conducted as a "dental clinic," for the benefit of the employees, in a section of the store laid out as a hospital. The equipment, as the accompanying illustration shows, is of the very best, and complete in every particular, including a powerful American Interrupterless X-Ray outfit.

Let it be clearly understood that the purpose of this department is for relief of pain, prophylaxis, consultation, advice, and for X-Ray work, and that there are not any actual dental operations in the way of restorations of any kind undertaken. The X-Ray equipment is particularly beneficial to the company's employees, and is in con-

stant use to discover such conditions as: Suppressed teeth; portions of roots broken in extraction; septic conditions at ends of roots; penetration of root canal; position, directions and length of roots of teeth; necrosed conditions; extent of absorption of alveolus; abscesses; to determine whether root is filled to end; pathological antrum conditions; otitis surrounding the root; broken instruments in root; destruction of bone as a result of alveolar abscess or necrosis;



existence of pulp stones or spiculæ of bone in pulp chamber; for purposes of discovering decay of roots under crowns or under filling in approximal cavities; fractures, etc.

Radiographs are available free of charge to the employees for purposes of diagnosis. As the dental office is in conjunction with the store hospital, the X-Ray equipment is frequently called into use by the physicians in the hospital.

The dental profession will understand, as indicated above, the

service rendered by this department is two-fold. By the chart used as illustrated in the accompanying cut, the employee is instructed as to the actual condition of the teeth, and his need of professional attention. And a radiograph is supplied for the employee's private dentist or physician, if required.

Then there is the relief work, prophylactic work, the treatment of incipient pyorrhea cases, and the countless opportunities for little educational talks and for general helpfulness and other such preventive efforts, which go to make a patient's mind at ease; give freedom from pain and irritation, and which are conducive to all amiable virtues.

The Preparedness League of American Dentists

OUR SECOND ANNUAL MEETING

J. WRIGHT BEACH, D.D.S., BUFFALO.

THE second annual meeting of the Preparedness League of American Dentists, held at the Hotel Astor, New York, in conjunction with the National Dental Association, Oct. 22-26, was most successful from every standpoint. The programme was varied, interesting and instructive, the first session of which was opened by a short address entitled "The League," by J. W. Beach, chairman, followed by Mr. Leon Dabo, of New York, member of the French Legion of Honor, who had just returned from the scenes of the world's greatest conflict, having been sent there to investigate and report on the moral and physical condition of the armies with a view of establishing for our own boys the most favorable influences and surroundings obtainable.

His impassioned recital of the appalling scenes witnessed, the absolute proof of the atrocities committed, many of which could only be hinted at in the presence of a mixed gathering, so affected his audience with the unspeakable horror of it all that for several moments after he had ceased speaking everyone seemed stunned as if by a terrific blow delivered from that unseen mailed hand itself.

The makers of our homes, whom every real man must cherish, love and respect, have, within the lines of the enemy, been but hapless objects of the vilest, most insanely bestial acts ever perpetrated by animated beings masquerading in the garb of men. Tender years, decrepit age; budding womanhood or hallowed motherhood meant naught to them. Fiends incarnate from the cesspool of hell have been unchained to belch forth their noisome blasts of iniquity and drag their fetid, clammy shapes over God's verdant footstool to irreparably blight the choicest flowers His infinite mind has fashioned.

Thirty-five thousand young girls who soon are to become mothers;

hundreds also, many of whom are mere children, being eaten alive by a most loathsome disease transmitted by these miserable beasts. These innocents doomed to a living hell, the only compensation for which is its short duration, were seen with finger nails falling off, noses sloughing away, pates devoid of hair, together with many other signs of these arch-devils' high jinks.

Little better, too, are those hapless young men who no longer are men, due to the insatiable fiendishness of a nation that but a few short years ago could claim a high state of civilization and advancement in the arts and sciences not surpassed, if, indeed, reached by any other people. Such is the story of the most rapid retrogression of any nation in the history of the world. The upward climb has but accelerated the downward pitch and every means of construction has been multiplied to produce diabolic destruction.

Much more was said, still more inferred, until it seemed as though no mortal mind could further comprehend. And yet, a sense of pity springs up from some far-off point that men can fall so low; but by their own hands they must suffer, even to the third and fourth generations.

The message Mr. Dabo left more deeply impressed all who heard him with the necessity of immediate support and action, the immeasurable gravity of the crisis and the responsibility that is upon the American people.

Burton Lee Thorpe, of St. Louis, known to our profession as one of its most forceful writers and orators, gave a stirring address on "Our Profession's Patriotism," which not only was enjoyable, but most fitting at this time. We will not anticipate the many pertinent facts and characteristic sayings with which he regaled his audience, as his address will soon appear in print.

Charles F. Ash, President of the First District Dental Society, member of the sub-committee on Preparedness League of American Dentists of the Committee on Dentistry and Director of Departments for the great drive to make dentally fit the men drafted into our new national army, spoke of the work of the League, and particularly of its financial problems. He told of the plans followed in the Metropolitan District and impressed the fact that our members who pay the meager fee of \$1.00 to join the League need not fear that the money will lie idle while our great work is going on, or that a faithful accounting will not be made.

S. Marshall Weaver, of Cleveland, chairman of the Committee on Ambulances, next held the closest interest of the audience in describing and showing many slides of a most completely worked-out plan for Motor Dental Ambulances to be sent to France. It would require pages to adequately describe this ingenious dental office on wheels, a few pictures of which will be found in the November Journal of the National Dental Association. We will just say, however,

that this activity of the League is of the greatest importance, and our profession will be made proud of the great benefits that will come to our soldiers through these agencies for the relief of suffering. This movement is to be prosecuted with all the vigor and strength our committee can throw into it.

W. C. Speakman, of Wilmington, who took the first dental ambulance to France, showed several slides of it and gave much valuable information of practical character. He is a member of the committee and is rendering valuable assistance. He tendered his ambulance to the League, which was gratefully received and will be No. 1 of a fleet of fifty to be sent over.

Major G. H. Thomson, Assistant Director of Dental Services, Military District No. 6, Halifax, N.S., gave a paper on "Dental and Facial Surgery in the Army," which was replete with practical information for us who have yet to win our laurels in this great department of service to our country. His attendance at our meeting was very gratifying to the chairman, who long has valued him as a friend and an example to follow as a professional man. In the capacity of an officer, he is even more valuable to his country. Ours is now a common cause and we glory in the union of our interests in this great cause of justice and humanity. Our feeling embraces the whole profession of Canada and more particularly the splendid boys of the Canadian Dental Corps.

Lieutenant W. A. Heckard, of New York, representing the Surgeon-General's office in the great drive to make dentally fit the drafted men to enter the new National Army, gave an excellent address on the work now going forward. We were much pleased to have our members know him, as his is the most familiar name before our profession in this connection, at this time. The paper will appear in an early issue of the Journal of the National Dental Association.

Captain Fred Mallory, of the Canadian Dental Corps, who has seen two and one-half years' service with the British army, answered a great many questions of practical interest to us and gave much important information in our present emergency. Trench mouth was explained and the remedy given.

Dr. De Lan Kinney, of New York, chairman of sub-committee on dental service, war service committee, Medical Women's National Association, told "What Women Dentists are Doing in the Present Crisis," and explained the relations of the League to the organization which she represents. She is organizing a Women Dentists' Auxiliary of the League and already has many pledges of time given for work for recruits and this new phase of our work bids fair to play an important role among our various activities. The League is deeply sensible of the fact that our women dentists cannot become members of the Dental Reserve Corps, and that they are as anxious, and in

many instances more willing to do their "bit" than some of their sterner confreres, therefore, it is with much satisfaction that we are able to furnish them an opportunity to utilize their valuable services in this great work.

Dr. Kinney also has arranged for the Dental Hygienists to work for the soldiers, and it is gratifying to state that they have shown a most creditable willingness to assist in their peculiar field. We are watching these developments with keenest interest.

Herbert A. Pullen, our vice-chairman, gave a comprehensive address on "The Value of the Educational Work as Being Executed by the Preparedness League of American Dentists." He thoroughly covered the field of the study course, and we hope to publish his paper at an early date, as the information contained will be of much assistance to newly formed sectional units.

W. D. Tracy, of New York, member of the sub-committee on Preparedness League of American Dentists of the Committee on Dentistry, gave a very interesting paper on "State Organization Work of the League." As Director of Dental Activities for the Northeastern Military Division, Dr. Tracy was able to give those present much necessary information relative to ways of organizing for better service, and he made it plain that no great work can be carried to a successful issue without thorough organization of its integral units; therefore, if we can hope for the best results, we must give first consideration to this fundamental principle. The paper will be printed as soon as possible because of its practical significance.

Reports of sectional units formed the concluding part of our programme and took the character of a good old experience meeting following the sporadic revival of Methodist camp meeting days. It was truly illuminating to hear of the wonderful work being done throughout the country by our sectional units. We are prouder than ever of the magnificent response our profession is making to the call of *our* boys who now are fighting in the trenches.

Our exhibit! Well, we are sorry we cannot describe it or convey to you a picture of the attractive features presented. The Belgian war dog, Prince, the property of Dr. Speakman, of Wilmington, was a most popular adjunct. The exhibit of trophies from the battle field, also the property of Dr. Speakman, created great interest. The army exhibit was much enjoyed, as were many other features shown by the League.

We wish publicly to thank our Committee on Arrangements for their invaluable aid, and particularly the women dentists and dental hygienists, who were so faithful in their attendance and showed such a willing spirit to serve the interests of the League without compensation. These are some of the many instances of happy co-operation that will always stand out as a most pleasing part of our great meeting.

We must not fail to mention our Liberty Loan booth at the Preparedness Exhibit. During the meeting, which was the last week of the loan campaign, \$30,500 was pledged, \$10,000 of which was the subscription of Mrs. Thompson, through Dr. C. F. Ash, to the League Ambulance Fund. It was a splendid thought of Dr. Ash and puts this sum to patriotic use during the time required to get the ambulance standardized and manufactured. We are proud of the record of our booth, which is further evidence of the broad policy of the League to embrace every creditable activity beneficial to our great cause which may rightfully come within its scope.

WHAT THE LEAGUE HAS DONE.

1. United the Dental Profession for a Definite Purpose.
2. An important factor in making a New Profession.
3. Helped organize the Dental Profession for war service.
4. Provided a medium through which the Surgeon-General's office could utilize the services of the dentists of the United States.
5. League members have gratuitously cared for the teeth of more than 50,000 recruits and conscripts, a large percentage of whom were rejected because of dental defects.
6. The League, through the efforts of two of its officers, Dr. C. F. Ash and Lieutenant Heckard, inaugurated the great drive, now sweeping over the United States, to make all accepted drafted men dentally fit to battle for our country.
7. The work of the League, therefore, has done much to improve and sustain the health of our fighting forces, thereby preventing untold suffering and assuring immeasurable comfort to our soldiers.
8. The League has given every member a chance to do his "bit," thus engendering greater patriotism and a desire to do more for our great cause.
9. More than one hundred sectional units have been formed throughout the country as nuclei for organized work and the study of war oral and dental surgery.
10. Formulated an amplified study course, with special reference to present needs, and hundreds of lectures and clinics have been given.
11. Has been a means of creating and supplying the desire for knowledge and improvement among thousands of members of our profession throughout the land.
12. Originated the idea and plans (Cleveland Unit, Ohio Division, Sept., 1916) for providing Motor Dental Ambulances for use in the war zone.
13. Our committee has standardized style and equipment for ambulances, and manufacture is about to begin.
14. Dr. C. F. Ash has received for the League, a subscription of \$10,000; the Western Dental College and Kansas City members are

raising \$10,000. California and other states are raising funds, also, for dental ambulances.

15. The League proved a most important factor in helping to fill the Dental Section of the Officers' Reserve Corps, several hundred applications passing directly through our National Headquarters.

16. The League has stimulated fraternal spirit, one object of which is to provide for the care of the practices of its members who have entered their country's service.

17. Concerted action through our organized endeavors has done much toward creating sentiment for favorable legislation. This influence has been recently demonstrated.

18. The League has been instrumental in bringing out hundreds of young men hitherto comparatively unknown.

19. The Liberty Loan Campaign has received material assistance from the League through the work of the local units.

20. Buffalo unit supplied \$1,200 equipment for Base Hospital No. 23.

21. In short, the League has for twenty-one months, been preparing our profession in every way to render our best service during the period of the war.

The Need for Dental Inspection in Rural Schools'

RICHARD G. McLAUGHLIN, D.D.S., TORONTO.

(The following paper was prepared for presentation to the East and West Kent Teachers' Associations, and is now published in the hope that it may be of assistance to members of the profession who are invited to address similar bodies. It is interesting to note that at the conclusion of the paper, resolutions were enthusiastically and unanimously adopted by the conventions, asking the Government to move in the direction outlined by the author.—Editor.)

I AM glad to have the privilege of addressing you on a subject so far-reaching in its importance as the one which we have under consideration at this time. The teaching profession and the dental profession, although seemingly far separated in their lines of work, after all are aiming at a common goal; namely, the fitting of boys and girls to do, in after life, the very best work of which they are capable.

Education, broadly speaking, is the training and developing of youth for efficient citizenship. Efficiency—the highest, the maximum efficiency—is the world's insistent demand. As time goes on the call becomes more imperative. It comes from the office manager, from all commercial organizations, from banking houses, from railroad corporations, from the army, from the navy, from the educational institutions, from everywhere, where men and women are wanted. Such

is the finished product for which you as teachers and leaders are held largely responsible. To measure up to such a standard the candidate must be fit physically, mentally and morally.

If what I say to you this afternoon will aid you in any way in meeting this insistent demand, I will be amply repaid.

The close relationship existing between physical health and mental activity was never more emphasized than to-day. In order that a man may be at his best, and fit to do his best work, every organ in the body must be perfectly healthy, and so able to perform its natural functions. For example, a dyspeptic can never be the strong man, physically and mentally, that he would have been had his stomach been in a normal condition. It has been stated that Napoleon lost the Battle of Waterloo because of over-indulgence, that morning, in his favorite dish of fried potatoes.

To-day, we are understanding that the mouth and teeth wield an important influence in a man's life. Dr. Mayo, of the renowned Surgical Institute, of Rochester, Minn., has made the startling statement that in his estimation 80 per cent. of all our ills have their origin above the collar. Nor are we surprised at such a conclusion, when we consider the fact that the mouth is the main gateway, or vestibule, to the whole body. Through it must pass the food, and in most cases the oxygen that goes to build up the body.

Probably the most important organs in the mouth are the teeth, holding as they do, the strategic position at the entrance to the alimentary canal and respiratory apparatus, and intimately connected with the nervous system, the teeth truly dominate the whole organism of man.

The common idea that a violent toothache is the ultimate penalty nature will exact for neglected and decayed teeth, is one of those delusions that recent dental and medical science has completely swept away.

Let us consider that statement. There are, at least, two essentials to a child's development and man's efficiency: First, the body must be properly nourished, and second, it must be protected against disease.

To be properly nourished, a growing child at school must have sufficient food, and that food must be properly digested and assimilated. Now the main function of the teeth is to masticate food. This mastication is the first step, and in the case of some foods, the most important step in the process of digestion. If the food is to be properly prepared in the mouth for the fluids of the stomach, it must be crushed into small particles by the teeth, and in so doing thoroughly mixed with the saliva, before being swallowed. The point in this: If in the mouth this first step in the process of digestion be not properly performed, so that the stomach is not unduly

burdened, how urgent it is that the teeth be in good sound condition, free from any soreness and properly articulated.

Bolted food or food not properly prepared by the teeth and saliva, is looked upon to-day, by the medical profession, as a direct cause of the large percentage of stomach troubles. Some years ago Dr. William R. Woodbury, of Boston, Mass., made the statement that a very large percentage of cancer of the stomach was due to bolted food.

Let us for a moment look for the main cause; one writer very tersely puts it: "Man eats along the line of least resistance." If that be true of a man, how much more is it true of a boy. It simply means this, if a tooth on one side of the jaw is badly decayed and sore, he will not use that side on which to masticate his food. Now, if he is still neglectful, and one or two teeth on the other side become troublesome, he will not use that side either, and so the food is merely rolled around by the cheeks and tongue for a moment or so and then bolted. Now in such a case the stomach cannot do double duty—its own share of the digestive process, and also that which should have been done in the mouth—and so the food is only partially digested, and results in a two-fold injury to that boy; namely, he is robbed of part of the nourishment which should come from the food, and second, the kidneys and other eliminating organs are overworked to rid the system of the extra poison consequent upon such faulty digestion.

Nature intended that our teeth and jaws should be vigorously used in masticating food. If we examine the skulls of the primitive inhabitants of this land, we will find a well-developed muscular jaw and a fairly sound set of teeth. Why? Not because of the constant use of the tooth brush, but because the food of the savage was of such a character as to require vigorous mastication before it could be swallowed—dried or partially cooked meat, and hard, coarse bread. To masticate such food not only builds up strong, healthy teeth and jaws, but the constant rubbing of this hard food over the teeth is nature's effective way of cleansing the teeth. As long as we persist in tickling our palates with sloppy foods—jellies, angel cake, and the so-called predigested foods—we must make up our minds to have poor teeth and weak stomachs. We should aim at having in the last course of each meal some food that would require vigorous mastication.

But there is another and more serious side to this matter of neglected and decayed teeth. It is the matter of infection. A great medical authority tells us that the majority of the people who die to-day, die as the result of a simple infection, and also that the majority of these infections have their origin in, or can be traced to the mouth. It becomes a serious question. A neglected and unclean mouth is an ideal harbour and breeding place for germ life. Here

we have the necessary heat and moisture, and food lodging round, and in badly decayed teeth, to give the microbes every opportunity to get in their deadly work. Here we find the germs from which come: Tuberculosis, typhoid, rheumatism, diphtheria, scarlatina, neuritis, etc. The number and virulence of these germs depend on the condition of the teeth in the mouth. Many of the cases of tubercular glands with which our young people are afflicted, can be traced to the mouth, where the bacilli has found entrance, through the canal of a decayed and dead tooth, to glands and blood stream. Many a case of long standing rheumatism or neuritis or some serious stomach trouble is, to-day, being traced to some hidden abscess at the root of an individual tooth.

These cases are coming to our notice in such numbers recently that the medical and dental profession are convinced that any one who has in their mouth such a diseased tooth, lives in the danger zone of some infectious disease, as that infection is constantly being drained into the circulation, and so, lowering the vitality, it may, at any time, attack some of the joints or vital organs.

Let me state further that a great many of these infectious diseases that to-day are being traced to the mouth are found to be caused by, or come from, those teeth that are abscessed at the root. I do not mean particularly those violent abscesses which cause much pain and swelling, etc., but those passive or hidden ones unnoticed for years, but constantly carrying the deadly germ into general circulation.

Now, knowing as we do to-day, the danger of a neglected and germ-breeding set of teeth, is it not of vital importance that we bend our efforts to safeguard our school children by the use of all possible preventive measures? Every boy and girl in our public schools should be taught the importance of a sound, clean set of teeth—the dangers attending an unhealthy and unclean mouth, and how properly to care for their teeth.

It is estimated that over 90 per cent. of the children in our schools have defective teeth. Then it is safe to estimate that at least 50 per cent. have such bad teeth as to cause suffering, and prove a physical and mental handicap. What is being done to improve this? In some of the larger centres something is being done. In Toronto some considerable progress has been made. We have a Dental Inspector, assisted by a staff of dentists and nurses. The children's teeth are regularly examined and defects reported. They are carefully taught to properly care for their teeth. Also clinics are established in various centres in the schools, and the teeth of the poorer children are cared for. The result is that in four years the number of children having defective teeth has been reduced from about 95 to 51 per cent. Also a marked improvement in the health, conduct and progress of the children is noticeable.

But for the children in the rural districts, as yet, nothing definite has been undertaken. That is not fair for the country boy or girl, and that is the point we are trying to impress on the authorities to-day. This matter is just as serious for the country boy as it is for the city boy. Why should not his future be safeguarded?

The Dental Association of this province is making a strong effort just now to induce the Government to introduce into every section of the province a system of dental inspection and dental education. The Government is impressed with the importance of this matter, and the need for some action. It is natural that the teachers of the province be particularly interested in anything that will tend to the welfare of the children under their charge, and no doubt the Government would be glad to hear from the teachers on the matter. Now we believe that if a simple, workable plan for dental inspection and education in the rural districts be presented to the Government, it would be adopted and put into force.

In the following plan the object sought has been to co-relate the work of the school, the home and the local health officer, the work to be under the direction of the Provincial Board of Health, co-operating with the school authorities and teachers and members of the Women's Institute of the province.

(1) Work to be started in a small way. One chief dental inspector with office at Parliament Buildings, to direct the department. Two dental inspectors to visit the schools. Salaries, office expenses, equipment and literature to be provided by Provincial Government.

(2) Actual travelling expenses to be paid by the township in which the dental officer inspects the schools.

(3) Legislation to provide for carrying on the work in the schools.

(4) Women's Institutes be invited to assist, by educating the people, so as to create a request for the inspector, and arranging public meetings of parents, at which the dental inspector would speak, and thus procure the co-operation of home and school, that the ravages of dental disease might be largely prevented.

If we are to be successful in inducing the Government to adopt this or any similar plan of dental inspection, we feel satisfied that a resolution from this convention favoring and urging such legislation, would have considerable weight, and hasten the incoming of a better day for the boys and girls of the rural schools.

TO DESTROY ODOUR OF LYSOL OR IODOFORM.—To remove the odour of lysol or iodoform from the hands, rub them thoroughly with ground mustard. Moisten the hands with cold water, place a small quantity of dry mustard in the palm, rub it over the hands, and wash off with soap and water. The odour can be removed from utensils in the same way, with the exception that the paste should be allowed to remain for several hours.—*Dental Cosmos*.

The Composition of Saliva in Relation to the Incident of Dental Caries

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INTRODUCTION.

IT has been previously reported by the writer (4) that the ratio of the neutralizing powers, or the power to maintain neutrality, or normal resting saliva and of the activated saliva, obtained by the chewing of paraffin, bears a definite relationship to the incidence of dental caries. In persons with carious teeth this ratio, expressed as a percentage, exceeds 80, while in persons whose teeth are temporarily immune from (or, more correctly, resistant to) caries, the ratio falls below 80. In other words, as the difference between normal resting saliva and activated diminishes, so does the liability to the incidence of caries increase. Shepard and Gies, in discussing this relationship or "salivary factor" have maintained (5) that it is inconstant. They based their conclusions, however, upon data which included all the different types of stimuli indiscriminately without regard to the nervous impulses and reflexes produced by the sense of taste. In their experiments they used paraffin, sucrose, sodium chlorid, alcohol and certain combinations of these. It was subsequently stated by the writer (8) that comparisons of saliva, the samples of which have been collected under different conditions, are inadmissible since such procedure ignores entirely psychic influences. Recalculation of their figures confirms the findings originally reported (4).

In a second communication (6) the writer presented data which both substantiated and developed the above thesis. Reports were made of investigations conducted in some of the state institutions for the insane, and consisted of analysis of saliva from certain cases dementia praecox and epilepsy. This work was likewise criticized by Gies (7) and answered in turn by the writer (9). No data have been presented which disprove any of the conclusions drawn in either paper (4 and 6) and it is in the further development of the consequences arising out of these conclusions that the following experiments were undertaken.

There are two main questions which fall under consideration in this connection, namely, first, the origin of the change of the neutralizing power of saliva which occurs in response to certain stimuli, and second, the significance of this change in relation to the incidence of dental caries. In other words, whether the alteration of the salivary factor is a contributing cause of dental caries, or conversely, an effect produced by dental caries, and lastly, whether there is a cause common to both altered factor and dental caries, in which case the factor would become merely an incidental symptom.

In connection with the first of these problems, I have sought to throw light on the origin of the differences between the neutralizing powers of different samples of saliva: (a) By dialysis experiments in which the attempt has been made to determine the relative magnitudes of the parts played by the inorganic, or at least the diffusible substances, and the non-diffusible, and presumably organic, constituents of saliva. (b) By the determination of the amino nitrogen content of various samples of saliva after hydrolysis with a view to estimating more exactly the part played by protein in contributing to the difference in properties and composition between normal resting and activated salivas. In connection with the second problem, I have sought to extend the observations of Pickerill upon the relationship of diet and habit to the incidence of dental caries and furthermore to determine the influence of the locality of the stimulus upon the neutralizing power of the secretion which is evoked.

PART 1.

The Origin of the Differences in Neutralizing Powers Displayed by Normal Resting and Paraffin Activated Saliva.

(a) The relative magnitude of the parts played by diffusible and non-diffusible substances in determining the neutralizing power of saliva.

The experiments were carried out as follows: Saliva was titrated and a second set of samples was dialyzed for a period of time; then the liquids both outside and inside the membrane were separately titrated.

The dialysis of the samples was made in these cases where a sufficient quantity of saliva could be obtained without conscious exertion on the part of the patient. Following the method of Clausen (10) and Porter (11) a solution of gun cotton in an ether alcohol mixture was made. From this solution collodion thimbles were fabricated and then placed in recently boiled distilled water until ready for use. From 2 to 5 cc. of the sample were measured directly into the thimble and then placed in a small prescription vial. Boiled distilled water was pipetted into the bottle until the level of the sample

exactly coincided with that of the water. Decomposition of the sample was prevented by adding one drop of chloroform and one drop of xylol. The bottle was tightly corked and placed in an airtight cabinet for twenty-four hours, at a temperature between 20 and 24 deg. C. At the end of this time the liquid outside the membrane was titrated separately from that inside the membrane. Theoretically, if there were no loss of CO₂ from the sample, the sum of the two titration figures for either alkalinity or acidity should equal the original titration value. But a slight precipitation of phosphates, which is always evident, demonstrates that some loss of CO₂ has

TABLE 1
Comparison of Undialyzed and Dialyzed Saliva

Number	RESTING SALIVA								ACTIVATED SALIVA							
	Resting saliva before dialysis				After dialysis outside tube				Activated saliva before dialysis				After dialysis outside tube			
	Inside tube				Total dialyzed				Before dialysis				After dialysis outside tube			
	Cubic centimeters of HCl				Cubic centimeters of NaOH				Cubic centimeters of HCl				Cubic centimeters of NaOH			
E 4	6.60	3.00	2.00	5.00	13.75	9.20	4.20	13.40	24.15	16.00	2.65	18.65	4.75	2.85	1.65	4.50
E 1	9.00	6.20	5.40	11.60	9.50	8.25	0.20	8.45	17.75	14.00	0.95	14.95	5.50	4.40	0.69	5.09
E 6	19.50	12.30	1.28	13.58	6.50	6.00		6.00	48.30	46.50	3.40	49.90	1.20			
E 7	8.75	6.50	0.00	6.50	9.80	10.70		10.70	25.20	21.40	2.40	23.80	4.55	3.40	1.00	4.40
E 9	10.70	8.10	1.00	9.10	7.30	4.85	0.85	5.70	15.80	14.45	1.15	15.60	3.10	3.00		3.00
E 10	14.00	9.25	3.15	12.40	5.00	4.90	0.75	5.65	16.35	13.70	2.00	15.70	4.80	2.10	2.25	4.35
E 11	17.45	10.25	7.00	17.25	7.40	3.30	0.90	4.20	19.10	18.30	3.00	21.30	2.90	1.75	1.00	2.75
E 12	7.25	4.00	3.15	7.15	11.75	8.10	2.70	10.80	19.90	16.70	2.20	18.90	4.85	3.10	0.95	4.05
E 13	8.50	4.85	3.20	8.05	12.40	9.60	3.00	12.60	22.70	20.10	1.50	21.60	5.40	4.00	0.90	4.90
E 14	16.40	9.70	5.80	15.50	8.90	4.80	3.90	8.70	35.40	23.10	3.40	26.50	1.70	1.00		1.00

TABLE 2
Dialysable Proportion of Neutralizing Power

NUMBER	CONDITION OF MOUTH	NORMAL RESTING SALIVA			PARAFFIN ACTIVATED SALIVA			
		Neutralizing power before dialysis	Neutralizing power in dialysate	Dialysable proportion of neutralizing power in percentage	Neutralizing power before dialysis	Neutralizing power in dialysate	Dialysable proportion of neutralizing power in percentage	Salivary factor
E 4	Immune	20.35	18.40	90.01	28.90	23.15	80.10	70.41
E 1	Immune	18.50	20.05	108.38	23.25	20.04	86.19	79.57
E 6	Immune	26.00	18.58	75.31	47.10	49.90	105.94	55.20
E 7	Immune	18.45	17.20	93.22	29.75	28.20	94.79	62.02
E 9	Cariou	18.00	14.80	82.03	18.90	18.60	98.41	95.23
E 10	Cariou	19.00	18.05	95.00	20.15	20.05	99.50	94.29
E 11	Cariou	24.85	21.45	86.11	22.00	24.05	109.32	113.00
E 12	Immune	19.00	17.95	94.47	24.75	22.95	92.77	76.76
E 13	Immune	20.90	20.65	98.80	28.10	26.50	94.31	74.37
E 14	Immune	25.30	23.20	91.70	37.10	27.50	74.12	68.20

occurred. Data based on twelve, thirty-six and forty-eight hour dialyses showed a wider variation than those based on the twenty-four hour limit and this later time, consequently, was chosen as a standard.

The results of this work are reported in tables 1 and 2. The analyses, although of questionable quantitative value, demonstrate, qualitatively, that the greater percentage of alkalinity and acidity is found in that portion of the sample which has dialyzed through the membrane and due, therefore, to inorganic constituents. With subject No. E4 the alkalinity of 10 cc. of the resting saliva was 6.60 cc. N 200 HCl. After dialysis the alkalinity outside of the membrane was 3.00 cc., and inside the membrane, 2.00 cc. The activated sample exhibited a marked difference for the titration figure of the undialyzed sample was 24.15 and for the dialyzed, 16.00 outside the membrane and only 2.65 inside the membrane. The acidities likewise show the same phenomena, the undialyzed normal resting saliva having a reading of 13.75 cc. N 200 NaOH, and the dialyzed 9.20 outside the thimble and 4.20 inside.

b. The amino nitrogen yielded by hydrolysis of normal resting and activated saliva.

In the utilization of the Van Slyke apparatus for the determination of the amino-nitrogen in the saliva the author has employed a method which combines accuracy with simplicity. The wide application which this apparatus has found in blood analysis recommends it favorably to the problem at hand. The procedure outlined in Hawk (14) was followed with a few modifications. The technic of the analytical work was performed by Mr. S. A. Waksman, and I take pleasure in acknowledging his service.

It was at first thought best to analyze the samples as soon as they were obtained from the patient, but this procedure is open to objection on account of the fact that there is so small an amount of gas evolved in the reaction that accurate readings of the gas volume are exceedingly difficult. Since it has been the custom in the salivary work to secure the material between eight and eleven in the morning, it was found inconvenient to make the determinations at the same time. To overcome these objections all the samples were hydrolyzed. Ten cubic centimeters of well mixed saliva were measured into a special digestion tube and 4 cc. of concentrated HCl were added. The tube employed was of soft glass about nine inches long and one inch wide. One end was sealed off and the other drawn out until the diameter was reduced to nearly 1-4 inch. After the introduction of the sample and the addition of the acid the small end was sealed. These tubes closed at both ends were placed in a water bath and digested at 100 deg. C. for four hours. Attempts to digest the samples by boiling over a flame and using a reflux condenser were

unsatisfactory, as bumping and loss of the material could not be controlled.

Having prepared the Van Slyke micro-apparatus in the usual manner, 2cc. of the well mixed hydrolyzed sample were carefully transferred to the measuring tube and run into the decomposing bulb. The bulb was shaken for ten minutes and the NO absorbed by the permanganate solution. The volume of nitrogen was read and the room temperature and barometer noted. Duplicate determinations were made and in many instances triplicates.

The results of the analyses are reported in tables 3 and 4 and represent the cubic centimeters of amino nitrogen at standard pressure and temperature yielded by 10cc. of sample. This calculation was made so that the data would be comparable to those of the titration experiments. Inspection of the table shows that, in the greater percentage of those cases which were classed as immunity from dental caries, the nitrogen content of the normal resting saliva is appreciably higher than that of the paraffin activated saliva. Those samples, however, taken from the mouths in which caries existed did not exhibit the same difference. These facts substantiate the work done on the dialysis experiments. For it was shown that the increase of total neutralizing power in paraffin saliva from immune cases was due to a larger amount of inorganic constituents.

TABLE 3
Caries

Date	Serial Number	Normal Resting, Cubic Centimeters of Amino N per 10 cc. Sample.	Paraffin Activated Saliva Cubic Centimeters of Amino N per 10 cc. Sample.	Electrically Stimulated Saliva Cubic Centimeters of Amino N per 10 cc. Sample.
September 18, 1916.....	G 2	2.20	3.00	3.80
September 21, 1916.....	G 2	2.50	3.00	
September 25, 1916.....	G 8	3.70	3.80	
October 27, 1916.....	G28	3.70	3.60	
October 27, 1916.....	G29	3.70	3.60	
October 27, 1916.....	G31	4.30	4.30	
November 2, 1916.....	G36	4.10	3.60	
November 2, 1916.....	G37	4.20	3.80	
September 25, 1916.....	G 9	3.10	3.30	
October 5, 1916.....	G 9	3.00	3.00	
October 30, 1916.....	G 9	3.40	2.80	
September 29, 1916.....	G10	3.30	3.40	
November 8, 1916.....	G10	4.15	4.27	
November 10, 1916.....	G10	3.77	3.63	
November 10, 1916.....	G18	2.80	2.95	
November 7, 1916.....	G18	3.10	3.20	
November 9, 1916.....	G18	4.10	4.00	
November 4, 1916.....	G38	3.90	3.80	
November 5, 1916.....	G42	4.20	4.10	
November 8, 1916.....	G44	4.40	4.50	
November 15, 1916.....	G 9	4.27	3.70	3.90
November 20, 1916.....	G 9	5.80	3.57	
November 23, 1916.....	G10	4.02	4.02	
November 2, 1916.....	G35	4.10	4.00	
November 4, 1916.....	G43	5.90	4.87	
November 21, 1916.....	G52	4.48	4.84	
November 21, 1916.....	G53	3.80	4.10	
November 23, 1916.....	G58	3.12	3.39	

TABLE 4
Immunity

Date	Serial Number	Normal Rest- ing Saliva, cc. of Amino N in 10 cc. Sample	Paraffin Activated Saliva, cc. of Amino N in 10 cc. Sample	Electrically Stimulated Saliva, cc. of Amino N in 10 cc. Sample
September 16, 1916	G 1	2.40	2.30	2.20
September 19, 1916	G 1	3.20	2.90	
September 19, 1916	G 3	4.60	3.80	3.50
September 26, 1916	G 3	5.70	3.30	
September 21, 1916	G 4	3.00	2.60	
September 28, 1916	G 4	3.50	4.00	3.20
October 9, 1916	G 4	3.80	3.20	3.40
September 21, 1916	G 5	2.90	2.70	
September 21, 1916	G 5	3.20	3.00	
September 28, 1916	G 5	3.70	3.90	4.60
October 9, 1916	G 5	3.60	3.00	2.90
October 3, 1916	G 6	3.40	2.60	
October 3, 1916	G11	3.40	3.10	
October 9, 1916	G11	4.90	4.10	
October 3, 1916	G12	5.00	4.10	
October 9, 1916	G12	4.20	3.80	
October 9, 1916	G14	4.00	3.40	
October 9, 1916	G15	4.20	3.20	
October 13, 1916	G16	3.90	3.70	
October 13, 1916	G17	4.60	4.00	
October 20, 1916	G19	2.90	2.30	
October 20, 1916	G20	3.60	3.40	
October 20, 1916	G21	3.50	2.70	
October 20, 1916	G22	4.20	3.40	
October 20, 1916	G23	4.50	3.40	
October 23, 1916	G24	4.10	3.70	
October 25, 1916	G24	4.20	3.90	
October 27, 1916	G24	4.10	4.00	
October 25, 1916	G25	4.60	2.90	
October 25, 1916	G26	5.60	3.00	
October 28, 1916	G26	4.30	3.60	
October 28, 1916	G32	5.10	4.30	
October 28, 1916	G33	5.60	4.50	
October 28, 1916	G34	4.30	3.80	
November 2, 1916	G34	4.20	3.90	
November 18, 1916	G26	5.80	4.10	
November 11, 1916	G26	5.75	4.00	
November 4, 1916	G39	4.80	4.10	
November 4, 1916	G40	4.60	4.15	
November 4, 1916	G41	5.71	4.05	
November 11, 1916	G45	4.87	4.63	
November 11, 1916	G46	4.80	4.00	
November 11, 1916	G47	6.24	4.37	
November 11, 1916	G48	4.97	3.97	
November 13, 1916	G48	4.63	4.05	
November 14, 1916	G48	4.70	4.13	
November 15, 1916	G48	4.90	4.06	
November 16, 1916	G48	5.04	4.20	
November 17, 1916	G48	3.51	3.30	
November 23, 1916	G25	5.25	3.10	
November 24, 1916	G25	5.44	3.19	
November 24, 1916	G26	3.80	3.20	
November 13, 1916	G26	5.80	4.10	
November 15, 1916	G26	5.75	4.00	
November 6, 1916	G49	4.97	4.14	
November 13, 1916	G49	4.87	4.14	
November 14, 1916	G50	5.50	4.06	
November 17, 1916	G50	5.21	3.99	
December 4, 1916	G55	5.93	3.67	
December 11, 1916	G55	5.70	3.67	

These later tests demonstrate that a smaller percentage of organic bodies, represented by the amino nitrogen values, is contained in this same type of saliva and that therefore the difference in titration equivalents must be due to inorganic material.

On averaging these tables, the following figures are obtained:

Immunity normal resting saliva.....	4.47 cc. amino N
Immunity Paraffin activated saliva.....	3.63 cc. amino N
Difference.....	0.84
Equals.....	20.7 per cent. of the mean
Caries normal resting saliva.....	3.89 cc. amino N
Caries paraffin activated saliva.....	3.72 cc. amino N
Difference.....	0.17
Equals.....	4.5 per cent. of the mean

The difference in nitrogen content between the normal resting saliva in cases of immunity and that in caries is strikingly brought out by the above tabulation. In the determination of averages, however, there is always an error which must be measured before the data may be considered conclusive.

The determination of the standard deviation of the mean demonstrates, however, the reliability of the results presented. These calculations were evaluated from the formula given by Davenport (15) as follows:

Standard deviation= $\sqrt{\frac{\text{sum of the squares of the deviation from the mean}}{\text{number of measurements.}}}$

Probable error of the mean= $0.6745 \times \sqrt{\frac{\text{standard deviation}}{\text{number of measurements.}}}$

	Caries	Immunity
Standard deviation normal resting saliva.....	0.645	0.913
Probable error.....	0.08	0.07
Equals.....	2.1 per cent. of the mean	1.8 per cent.
Standard deviation paraffin saliva.....	0.5564	0.569
Probable error.....	0.0735	0.0496
Equals.....	2.0 per cent. of the mean	1.4 per cent.

It is evident from these figures that the difference between the yields of amino nitrogen by normal resting and activated saliva in persons afflicted with dental caries is only twice the probable error of the mean; in other words, that there is either no difference, or at the most only a slight one between the average protein content of normal resting saliva and activated saliva secreted by such persons. In normal individuals, on the contrary, the difference between the amino nitrogen yields is no less than ten times the probable error of the determination and it is evident that in such persons there is a very definite divergence of composition between normal resting and activated saliva. The normal resting saliva of a person with caries approaches, in protein content, the activated saliva of a normal person, and stimulation by chewing paraffin results in little change either in protein content or in neutralizing power of the saliva secreted.

These relations are illustrated in the appended table showing the average neutralizing powers (that is the number of cubic centimeters of N/200 acid and alkali acid and alkali required to change 10cc.

of saliva from neutrality to phenolphthalein to neutrality to parani-trophenol) of normal resting and activated saliva in normal persons and in persons afflicted with caries. These averages are compiled from salivary analyses completed within the last two years, and comprise data obtained from over one hundred individuals. It is evident that saliva from subjects with carious teeth presents two distinct differences from saliva of immune subjects, namely, that the neutralizing power of the resting saliva is supernormal while that of the paraffin activated saliva is subnormal.

Average Total Neutralizing Power

	Normal Resting Saliva	Paraffin Activated Saliva	Average Salivary Factor
Immunity.....	23.693	38.324	61.82
Caries.....	30.096	30.932	97.24

The normal resting saliva of persons with carious teeth is, therefore, characterized by (1) a relatively high neutralizing power and, therefore, presumably, (2) a high content of diffusible substances; (3) a low content of proteins.

TABLE 5
Comparison of Values of Amino Nitrogen with the Total Neutralizing Power

Number	Normal Resting Saliva				Paraffin Activated Saliva				
	HCl	NaOH	Total neutralizing power	Amino N per 10 cc. sample	HCl	NaOH	Total neutralizing power	Amino N per 10 cc. sample	Salivary factor
	cc.	cc.		cc.	cc.	cc.		cc.	
G24	17.10	5.00	22.10	4.10	38.50	1.00	39.50	3.70	55.95
G26	27.40	4.70	32.10	5.60	58.45	-1.50	56.95	3.15	56.40
G26	20.00	4.50	24.50	4.30	49.00	0.50	49.50	3.60	49.50
G27	15.00	12.90	27.90	8.00	41.10	1.70	42.85	4.90	65.10
G 9	27.75	2.55	30.30	3.40	36.55	1.50	38.05	2.80	79.60
G45	28.50	-1.60	26.90	4.87	57.60	-4.15	53.45	4.63	50.30
G48	34.75	2.15	36.90	4.63	47.55	2.50	45.05	4.05	81.90
G48	24.00	3.30	37.30	4.90	35.00	0.60	35.60	4.06	76.70
G19	16.10	5.70	21.80	4.97	35.50	1.25	36.75	4.14	59.80
G10	18.40	3.70	22.10	5.50	31.60	2.30	33.90	4.06	65.20
G52	33.00	8.00	41.00	4.48	40.65	1.00	41.65	4.84	98.45
G53	24.15	3.95	28.10	3.80	30.80	2.80	33.60	4.10	83.60
G58	7.70	8.00	15.70	3.12	32.45	1.30	33.75	3.39	46.50
G58	11.90	6.00	17.90	4.10	33.45	1.25	34.70	3.70	51.60
G59	24.55	2.75	27.30	3.19	26.70	0.90	27.60	3.00	98.90

The inter-relation between the amino nitrogen and the salivary factor is shown in table 5. Subjects 52 and 59 were classed as carious, the others as immune. This connection of the one to the other is rendered all the more striking when the results of the dialysis experiments are kept in mind, for the data evaluated in table 1 pointed to the fact that the increase of the total neutralizing power is due primarily to an increased amount of inorganic substances.

Conversely, the lowered amount of organic bodies in activated saliva coupled with their greater neutralizing power brings further evidence to substantiate this conclusion.

From these results it is evident that immune persons secrete in response to stimulation by chewing tasteless substances a saliva which has a greater neutralizing power than normal resting saliva and is furthermore differentiated from normal resting saliva by a considerably lower content of protein and higher content of inorganic salts. The alteration in the character of the saliva is not merely due to dilution, consequent upon more rapid secretion, but involves a marked change in the relative proportion of the constituents. Persons with carious teeth differ from normal persons in that their normal resting saliva approximates in composition and neutralizing power to the composition of the activated saliva, in other words the salivary glands of such persons behave as though they were constantly receiving stimulus analogous to that constituted by the act of chewing a tasteless substance. Such a stimulus might conceivably be provided by carious teeth themselves, or on the other hand, both conditions may be attributable to a common underlying cause.

PART 2.

RELATIONSHIP OF DENTAL CARIES AND THE COMPOSITION OF SALIVA TO DIETARY CONDITIONS AND THE LOCALITY AND NATURE OF STIMULI PROMOTING SECRETION.

a. The relation of diet to the incidence of caries.

The alteration in the salivary factor may be due to either a direct or an indirect cause. If the former, then the presence of dental caries in an otherwise healthy mouth would initiate the change. If the latter, then the change is either incidental or comprises a portion of a vicious circle.

Among the indirect factors which may initiate an acute disturbance may be mentioned diet, a lesion or an infection, a chronic peripheral nervous affection, a central nervous affection, or lastly, a defect in the processes of repair and growth correlated with a defect in salivary function.

Diet comprises *per se* two factors, namely, composition and taste. The former has been the subject of much discussion and research and the conclusions reached by the many authorities appear to be rather negative in character. Data hereinafter reported will deal more particularly with this phase.

It has been shown (6) that the salivary factor is constant in certain types of insanity to the same extent as in the normal individual and from this fact the deduction may be made that differences in neutralizing power are not related to the central nervous system.

In receiving the literature concerned with the problems of dental caries and its possible relation to habits of cleanliness, climatic conditions, diet and general health of an individual or of a race, one notes a lack of uniformity in the recorded observations. This may be attributed to the fact that the many different writers were influenced in their judgment by different standards of observation, so that teeth which superficial examination would designate as non-carious might disclose, upon a more thorough examination, exactly the opposite condition.

Pickerill (1) states that certain food investigations point to the fact that the modern dietary of a civilized world differs from the diet of the uncivilized world in that the former is less hard but more tough, and requires, therefore, more triturating but less crushing. From this conclusion the idea is advanced that, since different sets of muscles are used in triturating than in crushing, the over development of these triturating muscles (buccinator and pterygoids) is responsible for both the abnormally shaped as well as the undeveloped dental arch. This, in turn, accounts for the increasing number of malposed teeth which accompany the under-developed arch. Malposed teeth are very susceptible to dental caries and therefore the increase of this disease among the modern civilized nations is correlated to our changed habits in masticating. Pickerill notes further that of the races of the world, the meat eaters, or at least those whose food is largely protein in character, were quite as susceptible to caries as those whose diet was mainly vegetarian. This is contrary to the views expressed by both Mummery and Patrick. The argument advanced by Pickerill is that the immune races, which include, according to some authorities, the Asiatics, Africans, Polynesians, Austrians, *et cetera*, owe their comparative freedom from caries to the fact that their diets were both varied and sapid. Their universal use of masticatories resulted in the prevention of stagnation within the oral cavity (p. 314) a fact which other investigations appears to support.

Dr. R. Thurnwald, in speaking to the author of his anthropological researches in New Guinea, mentioned that the inhabitants in that section of the world seem to be comparatively free from dental caries. Their diet is mainly vegetable, consisting of yams, sago, rice and sugar cane, etc.; meat is rather an accessory and, with the exception of the rather scarce mango, there are no acid fruits. The custom of chewing the betel nut plays, unintentionally, an important part, no doubt, in their oral prophylaxis. For at the age of puberty this custom, often connected with one of the initiatory ceremonies, is commenced and continued throughout the life of the individual.

Contrary to the usual belief, this betel nut habit does not blacken the teeth. For that purpose there is employed a mixture of cocoanut oil and soot which is vigorously rubbed on the teeth.

The betel nut is not used alone, but is combined with seeds or leaves of a peppery nature together with pulverized lime from calcined shells. These three substances are taken into the mouth one after the other and are masticated between meals. The old men are edentulous and prepare a paste by mixing the material before chewing. The natives expectorate profusely after the use of this mixture and the saliva is colored blood red. This coloration might be ascribed to the bleeding or to a compound formed by the action of the lime on the betel nut. The teeth are lost between the ages of forty and fifty and are exfoliated comparatively rapidly once the process has commenced. This exfoliation is accompanied by swollen and bleeding gums.

Calmulus is deposited upon the teeth in almost unbelievable quantity, and it is often the case with the adults to see the size of the lower incisors increased by these concretions to 300 or 400 per cent.

Underwood (2) after examinations of skulls from different collections makes the following comment:

"In the hot belt of the earth, including India, Africa and Southern China, bathing and washing are natural habits because of the heat; rinsing the mouth after meals and the use of sticks, tooth-powder, ashes and salt for cleansing the mouth is almost universal among the natives; while the food is largely rice, and no alcohol is used. In all of them caries is so rare that to all intents and purposes the natives may be regarded as immune."

He states further that the people of the arctic region whose personal habits, at least in regard to the care of the mouth, leave much to be desired, and whose diet is quite different, likewise enjoyed immunity. He considers the Australian native equally immune. These observations lead him to conclude that the use of artificial foods and the replacing of breast feeding exerts a direct influence in the "weakening of the tooth defenses." Just what constitutes "tooth defense" is not mentioned.

The effect of certain drugs upon the teeth has been dealt with by Austen (3). The systematic conditions which are supposed to favor the development of caries are anemia, dyspepsia, pregnancy, acute rheumatism, enteric and other continued fevers. Various salts and compounds of mercury, lead, bismuth, silver and copper were used in the experiments. Although it was found that the drug was partly excreted into the oral mucosa, yet it is rather an open question whether this excretion at one time may be so long continued as to accelerate or even cause any deleterious effect upon the erupted teeth. Another point, however, which may well be considered, is that the frequent drugging of growing children promotes a disturbance in the nutrition of the ameloblast and of the odontoblast, thereby bringing about structural changes in the enamel and dentin respectively. Histological

TABLE 6

Race	Teeth	Diet and Habits	Authority
Australian	"Toothache and indigestion common"	Large protein diet. Flesh sometimes eaten raw. Only vegetable. "Nardu" grass fern roots, yams	Eagle Bank and Crow, J. Mathieu. David Nutt, London
Australian	Teeth very tender	Chewing fiber from making of twine wears down teeth and makes them tender	The Australian Race, E. M. Curr. Tribunder & Co., London
Australian		Eat almost anything in the shape of animal food	Customs, Rites, etc., of the Aboriginal Tribe of the Gulf of Carpentaria, W. G. Stretton and E. C. Stirling. Trans. Roy. Soc. So. Australia, vol. 17, part 2, p. 240
Australian		Eat all the mammalian fauna	Report of the Horn Expedition, E. C. Stirling. Part IV, p. 51.
Northern Australians		Natives eat anything that is edible	Native Tribes of the Northern Territory of Australia, Spencer, MacMillan & Co., 1914, New York
Brazilian	Unusually liable to decay	Milk, cheese, farina, sun dried meat. Food is bolted and all expectorate rather excessively	Highlands of Brazil, R. F. Burton. Tinsley Bros., London
Eesa or Bedoin branch of Somal	Teeth do not project, are poor and stained from surat tobacco	Mutton, milk, butter, rice, millet bread, dates	First Footsteps in East Africa, R. F. Burton. Dent & Co., London
Egyptians,* Ancient and Modern	Toothache common	Diet mainly vegetables, bread of millet or maize; milk, eggs, melons, beans, lupins. The cleaning of teeth a religious rite	Account of Manners and Customs of Modern Egyptians, E. W. Lane. John Murray, London
Filipinos	Caries present in 20.90 per cent. of cases examined	Diet includes great quantities of sugar	Ottofy Lancet, 176, 1909, 263.
Friendly Isles	General good teeth, but poorer than those of other nations	(See natives of Island of Otaheite)	Captain Cook, Voyages of Discovery. Dent, London. Edited E. Phys.
Gallois Tribe	(See Somal)	Gourds the only vegetable. Habitual drunkards. Habitually use the tooth stick	First Footsteps in East Africa, R. F. Burton. Dent, London
Iggorots	Caries present in only 2.05 per cent. of a large number of cases examined	Camotes, a sweet potato, 30 per cent. of diet. Rice, 30 per cent. of diet. Other vegetables, maize, etc. 30 % of the diet. Fish, meat and eggs, 10 per cent. Sugar is distasteful and is not used	Ottofy Lancet, 176, 1909, 253
Otaheite	White and regular	Mainly carbohydrate in character. Teeth cleansed six times a day	Captain Cook, Voyages of Discovery. Dent, London. Edited E. Phys.
Natives of Sarawak	"Toothache and decayed teeth are almost unknown"	Rice, yams, cucumbers, fowls, and fish	Natives of Sarawak and British North Borneo, H. L. Roth. Truslone & Hansone, London, p. 77
Somal	Scattered teeth considered a sign of warm temperament	(See Eesa)	First Footsteps in East Africa, R. F. Burton. Dent, London
Somal	Teeth do not project, are poor and stained by tobacco	Teeth are cleaned by tooth stick. Flesh, holcus, few vegetables. Millet beer	First Footsteps in East Africa, R. F. Burton. Dent, London
Tasmanians	Among forty-two natives examined all had "very good teeth"	Refuse European food; eat rats, many vegetables of various kinds. Have enormous appetites. Meals are eaten with great greediness and great quantities are eaten at one time. Live chiefly on animal food.	Aborigines of Tasmania, H. E. Roth. King & Son, Halifax, England, pp. 8 and 9.
Tasmanians	Are reported by Cook LaBillardiére and Widowson as having good teeth		

TABLE 6—Continued

Race	Teeth	Diet and Habits	Authority
Tasmanians	Teeth much worn; decay uncommon	Soundness of teeth due to chewing hard and tough material	Daily Life of the Tasmanians, Bonwick
Makololo	Beautiful teeth	General mixed diet, including:—porridge, milk, butter, corn, honey, beer, wild fruit, elephant meat	Narratives of an Expedition to the Zambesi, etc., David and Charles Livingstone. John Murray, London, 1865
Kebrasbasa		Fowls, eggs, sugar cane, sweet potatoes, tomatoes, rice, maize; Kaffir corn	Ibid.
Manganja		Millet, maize, beans, nuts, yams, rice, pumpkins, cassava, sweet potatoes, etc.	Ibid.
Matumboka	"Teeth here are more solid and often wear down to the gums in old persons without decay. Cases of toothache not all uncommon, nevertheless"	Mixed diet	Ibid.

* Note that Patrick quoted by Pickerell cites the Egyptians as one of the immune races, the ratio of caries in 3,306 teeth examined being only 3,418 per cent.

examinations conducted along this line of experimentation would undoubtedly throw light upon certain phases of present therapeutic methods.

In table 6 are presented certain abstracts and notations upon the teeth and diet of a few races from different parts of the world. Definite information on the subject appears to be rather scattered, for in many instances an author may detail the foods at great length, the manner of cooking and habits of eating, but will overlook entirely the conditions of the masticatory apparatus. In so far as the relative amounts of protein to carbohydrate in the diet are concerned, the data to confirm Pickerill's (1) conclusion in this regard, namely, that the protein eating races are as susceptible to dental caries as those whose food is mainly carbohydrate. On the other hand, they appear to negative the popular impression that the teeth of primitive races are relatively immune to caries.

b. *Relation of type and locality of stimulus to the neutralizing power of the secretion of saliva evoked by the stimulus.*

If the chronic disturbance of the neutralizing power be due to a chronic peripheral nervous affection or to a lesion or an infection remote from the salivary glands or teeth, such a disturbance would probably act through nervous reflexes. If the locality of the lesion is important, then by applying a definite stimulus to a circumscribed area in the oral mucosa such nervous irritation so produced might be expected to influence the neutralizing power. One of the easiest methods of stimulation is the use of an electric current which has been passed through an inductorium, and experiments along these lines were projected.

In this series of experiments it was desired to determine what comparative differences would result in titratable acidity and alkalinity by the use of the electric current at different parts of the oral mucosa. It has been demonstrated that the mechanical stimulus obtained by the chewing of paraffin excites a flow of saliva which is markedly different from that found normally in the mouth. With the employment of the electric current, obtained from an inductorium, a third sample was secured which differed in titration value from either the normal resting or paraffin saliva. The amount of current used and the locality at which it was applied did not appear to produce any marked deviation from the general result. Although the strength of current varied with different individuals, only that strength was used which at the end of two minutes produced a tingling sensation at the point of contact. Whenever this amount was appreciably increased it was found to be prejudicial to salivary activity, as an unnecessary nervous tension was thus produced.

The apparatus consisted of two Edison Leland cells, type Z, connected in series with an inductorium and a key. The electrodes consisted of two platinum points mounted on a vulcanite handle. The electrode was applied to the mucous membrane at some predetermined point and the saliva thus obtained titrated in the usual manner. The different localities at which the electrode was applied were, first, the opening of Stenson's duct opposite the upper second molar in the buccal mucosa; second, the openings of Wharton's ducts and the ducts of Bartholin on either side of the frenum linguae; third, on the dorsum of the tongue at the juncture of the posterior with the middle third near the apex of the V formed by the convergence of the two lines of the circumvallate papillae; fourth at the gingivae. In applying the current at the bilateral structures one side was stimulated for two minutes and then the opposite side. No inflammation of the mucosa at the point of contact was developed at any time. The results of these experiments are reported in table 7. In the first column is noted the serial number of the patient, in each column "A" the alkalinity of 10 cc. of sample expressed in cubic centimeters of N/200 HCl.; in "B" the acidity of 10 cc. sample expressed in cubic centimeter of N/200 NaOH., and in "C" the total neutralizing power. The salivary factor appears whenever the paraffin saliva was taken; the distance of the secondary coil from the primary shows the comparative strength of the current and is expressed in cubic millimeters.

The data submitted demonstrate first, that the alkalinity of the electrically excited saliva is lower than that of the paraffin sample; second, that the acidity of the former is relatively higher than that of the latter; and third, that the neutralizing power of the saliva obtained by electric stimulus is lower in every instance than that collected by the paraffin method. This fact indicates that the use of

TABLE 7
"Electrical Stimulus"

Number	Normal Resting Saliva			Paraffin Stimulated Saliva			Electrically Stimulated Saliva			Factor	Coil	Date
	HCl	NaOH	T N P	HCl	NaOH	T N P	HCl	NaOH	T N P			
	A	B	C	A	B	C		B	C			

Stenson's duct

	cc.	cc.		cc.	cc.		cc.	cc.			cm.	
E 1	14.05	5.25	19.30	25.50	2.35	27.85	4.80	16.50	21.30	69.30	27.50	Dec. 28, 1915
E 2	15.30	5.80	21.10	34.40	3.25	37.65	18.20	5.50	23.70	56.50	25.50	Jan. 5, 1916
E 2	4.10	15.30	19.40	24.50	3.40	27.90	9.45	11.00	20.45	69.50	27.00	Dec. 28, 1915
E 4	6.60	13.75	20.35	24.15	4.75	28.90	7.55	17.75	25.30	70.40	30.00	Jan. 7, 1916
E 5	17.70	24.75	24.45	32.75	3.35	36.10	17.80	8.50	26.30	117.60	27.00	Jan. 10, 1916
E 6	19.50	6.50	26.00	48.30	-1.20	47.10	25.45	2.50	27.95	55.20	27.00	Jan. 8, 1916
E 7	8.75	9.80	18.55	25.20	4.55	29.75	10.65	7.00	17.65	62.40	27.00	Jan. 12, 1916
G 8	20.40	3.30	23.70	39.80	0.50	40.30	27.10	11.30	38.40	58.80	27.00	ept. 1, 1916

Warton's and Bartholin's ducts

E 1	9.00	9.50	18.50	17.75	5.50	23.25	10.75	5.30	16.05	79.60	30.00	Jan. 5, 1916
E 2	16.95	1.30	18.25	34.70	-3.75	30.95	20.15	1.50	18.65	58.90	32.00	Jan. 12, 1916
E 4	17.80	4.60	22.40	19.40	8.25	27.65	15.90	7.10	23.00	81.00	29.50	Jan. 8, 1916
F 1	16.25	6.95	23.20	29.50	2.70	32.20	19.05	6.25	25.30	72.09	30.00	Jan. 15, 1916
F 2	21.10	3.40	24.50	34.20	1.90	36.10	19.30	3.10	22.40	67.90	29.75	Jan. 16, 1916
F 3	20.10	3.10	23.20	24.15	2.75	26.90	15.00	2.30	17.30	86.20	29.50	Jan. 17, 1916
F 3	16.10	6.25	22.35	22.00	1.85	23.85	14.40	2.50	16.90	93.70	29.50	Jan. 18, 1916
F 5	17.70	4.50	22.20	37.40	2.50	39.90	14.25	3.95	18.20	55.70	29.00	Jan. 18, 1916
G 7	22.85	2.50	25.35				19.90	2.70	22.60		29.50	Feb. 22, 1916
G 8	15.15	6.50	21.65	44.85	1.50	46.35	27.55	11.00	38.55	46.71	27.80	July 22, 1916
G 8	26.05	7.75	34.80	44.55	3.10	47.65	26.40	11.80	38.20	74.70	26.00	Aug. 16, 1916

Tongue

E 1	8.70	10.50	19.20	16.75	4.85	20.60	11.35	4.45	15.80	93.20	28.00	Jan. 22, 1916
E 4	11.00	14.70	25.70				12.50	8.40	20.90		28.50	Nov. 11, 1915

Gingivae

E 6	18.25	7.60	25.85				22.95	3.30	26.25		31.20	Jan. 10, 1916
E 7	10.50	8.15	18.65				12.25	5.75	18.00		29.50	Jan. 13, 1916
G 43	17.25	8.00	25.25	21.60	2.75	24.35	16.55	5.35	21.90	103.70	25.50	Nov. 5, 1916
E 5	18.40	23.55	41.95				25.55	6.90	32.45		31.00	Jan. 11, 1916

the inductorium does not promote salivary activity to the same extent as the paraffin.

It was hoped that differential areas of irritation in the mouth could be demonstrated by means of this electrical stimulation, for it was desired to determine whether one part of the oral mucosa is more sensitive to extraneous influences than another, so that a local irritation in one circumscribed locality would tend to produce a greater change in the salivary neutralizing power than in another locality. The experiments, however, so far reported, have failed to supply any conclusive evidence.

The repeated use of the inductorium on one individual produces a marked effect upon the relationship of the normal resting saliva to the activated paraffin saliva. This electric irritation alters the factor in a few days from one which is comparatively low to one with a

much higher valuation. As examples of this condition may be cited subjects E1, E4 and G8. In the first instance the experiment was commenced on December 28, 1915. The Salivary factor at this time was 69.3. Electrical stimulation was applied and after eight days a second test was made. The normal resting saliva and the paraffin saliva were first collected and the application of the current repeated. It was found that the factor rose steadily from 69.3 to 79.6 and finally to 93.2. Similarly with E4 the factor at the start was 69.5, but rose in eleven days to 81.0. For subject G8 the factor evaluated on July 23, 1916, was 46.7; on August 1 it had risen to 74.7. One month later it had returned to nearly the same ratio as at the start and duplicate samples on successive days gave a factor of 58.8. The results reported are based on duplicate analyses and on duplicate samples obtained on successive days.

The determination of the reaction of the taste impulses upon salivary secretion was attempted by comparing the result obtained with a normal resting sample with those secured by the use of different substances of marked taste. Howell (12) and other investigators describe the taste sense as being composed of four fundamental sensations, namely, bitter, sweet, acid and salty. Tastes other than these are combinations of any two or more of the primary sensations and produce, therefore, a mixed stimulation of the sense organ. There was used for this experiment quinine on one day and sucrose on the second or third day following.

In securing the samples there was collected first a resting saliva and then the saliva secreted from the use of the taste stimulant. The results are reported in table 8. In the first column appears the sub-

TABLE 8
Comparison of Effects of Different Types of Stimulation Upon Salivary Secretions.

Number	Saliva Normal Resting			Saliva from Quinine Stimulus			Saliva from Sucrose Stimulus			
	A	B	C	A	B	C	A	B	C	
F1	16.25	6.95	23.20	20.65	4.55	25.20	13.80	10.70	24.50	
F2	19.55	4.20	23.75	33.95	2.00	35.95				
F2	25.50	5.00	30.50	25.80	3.75	29.55	17.15	8.00	10.15	
F2	21.15	7.50	28.65				18.45	5.50	23.95	
F3	20.70	3.70	24.40				13.25	8.00	21.25	
F3	18.40	5.40	23.80				9.95	8.25	18.20	
F4	19.25	4.75	24.00				15.00	6.20	21.20	
F5	19.10	5.75	24.85				10.65	8.00	18.65	
G7	22.85	2.50	25.35				12.60	3.60	16.20	
F1	18.05	4.70	22.75	19.60	13.40	33.00	13.85	7.00	20.85	

ject number. Figures in columns A, B and C represent respectively the alkalinity, acidity and total neutralizing power of each sample. It may be stated in general that the action of sucrose, the sweet stimulant, tends to lower the total neutralizing power of the saliva. Quinine, the bitter stimulant, appears to produce the opposite condition, yielding saliva resembling that secreted in response to the stimulus of chewing paraffin. The well known work of Miller (13) demon-

strates that fermenting carbohydrates such as would be found on the teeth tend to promote caries. From the above experiments it would be logical to infer that saliva favors the condition as well, since the neutralizing power of the sucrose-stimulated saliva approaches that of the normal resting saliva, and a factor evaluated on this basis would be of a magnitude corresponding to that which, under paraffin stimulus, would indicate the presence of caries.

SUMMARY.

Dialysis of saliva shows that the total neutralizing power is chiefly due to inorganic constituents.

The use of the Van Slyke apparatus in the determination of amino-nitrogen in saliva is a new application of this method. The results so obtained show that there is a definite correlation between the concentration of inorganic constituents, the amino-nitrogen content, and the neutralizing power of saliva; namely, that a high neutralizing power is associated with a correspondingly high percentage of inorganic constituents and with a low percentage of protein.

Data are presented which confirm Pickerill's observations concerning the effect of different constituents of the diet upon dental caries.

The use of the electric current as a salivary stimulant excites a secretion markedly low in alkalinity and correspondingly high in acidity when compared to the saliva resulting from the paraffin stimulus. The neutralizing power of saliva secreted in response to electrical stimuli is less than that secreted in response to the chewing of paraffin.

Differential areas of stimulation in the oral mucosa cannot be demonstrated.

The comparison of analyses of saliva obtained by a sweet stimulus (sucrose) with that obtained by a bitter stimulus (quinine) proves that the former yields a saliva low in neutralizing power and that the latter produces the opposite result, saliva secreted in response to bitter stimuli paraffin saliva in neutralizing power.

In conclusion, I wish to express my deep appreciation to Dr. T. Brailsford Robertson, for his interest evinced throughout the work as well as for the valuable suggestions offered. My thanks are also due to those students and clinic patients who have provided the necessary material for the experimental purposes.—*Journal of the National Dental Association.*

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Ontario Oral Hygiene Committee

THE Executive Committee of the Oral Hygiene Committee of the Ontario Dental Society, held its 61st meeting at The Crescent Inn, 473 Spadina Ave., on Thursday evening, September 28th, at 6.15 o'clock p.m.

Members present were: Drs. Reade, McLaughlin, Bothwell, Seccombe, Conboy, Ellis and Coyne.

Minutes of the last meeting were read and confirmed.

The committee composed of chairman, vice-chairman and secretary, appointed to obtain information regarding the dates and places of meeting of the various Teachers' Institutes throughout the province, reported having obtained the desired information, and having instructed the secretary to communicate with at least 13 of these institutes through the local dentists in these counties, asking them to bring the matter of lectures on oral hygiene, etc., before the school inspectors in their respective localities, and if possible to arrange for having lectures along the above lines delivered before the meetings of the various institutes.

The secretary then read correspondence from the following dentists, to whom he had previously written in regard to this matter: Dr. Higley and Dr. Hicks, of Chatham; Dr. M. A. Ross Thomas, London; Dr. F. R. Watson, of Georgetown; Dr. V. E. Heath, of Woodstock; Dr. O. S. Clappison, of Hamilton; Dr. E. E. Bruce, Kincardine; Dr. M. A. Morrison, of Peterboro; Dr. Cavanagh, of Cornwall; Dr. F. Kilmer, of St. Catharines, also from Dr. Bennett, of St. Thomas, regarding the Annual Conference. Five of these asked that the Oral Hygiene Committee send a man to address the Teachers' Convention.

The secretary also reported that four of the men written to failed to reply in any form, these were: Dr. Marshall, of Belleville; Dr. Little, of Owen Sound; Dr. Sparks, of Kingston, and Dr. Cowan, Brockville.

The chairman reported having arranged with Dr. Wallace Seccombe to address the Peterboro Teachers' Institute at Peterboro.

The secretary reported having arranged with Dr. O. S. Clappison, to address the Wentworth Teachers' Institute, at Hamilton.

After a somewhat lengthy discussion the following men were appointed to address the remaining four institutes: Dr. McLaughlin, to Chatham; Dr. Bothwell, to London; Dr. Webster, to Cornwall, and Dr. Coyne, to Paisley.

Dr. Conboy (who had been appointed on a committee with Dr. Seccombe and Dr. Ellis) then submitted a very comprehensive report on the findings of the said committee, regarding rural dental inspection, and also offered on behalf of the committee, suggestions

of very practical outline to follow, in further pursuing the matter of rural dental inspection.

Considerable time was spent in discussing the suggestions offered by Dr. Conboy, and finally it was moved by Dr. Bothwell and Dr. Eaton, that the report of Dr. Conboy's committee be adopted, and that the committee be instructed to push the matter to a conclusion.—Carried.

Dr. Seccombe offered some suggestions as to newspaper publicity in the matter of educating the public in the necessity of the care of the teeth, and the benefits to be derived from well-kept mouths. After considerable discussion, Dr. Conboy consented to be responsible for the work of preparing the matter for, and placing it in the possession of the press.

The Executive Committee of the Oral Hygiene Committee, of the Ontario Dental Society, held its 62nd meeting at the Royal College of Dental Surgeons, College St., on Tuesday, October 9th, at 5.15 o'clock.

Members present were: Drs. Reade, Eaton, Seccombe, McLaughlin, Ellis, Conboy and Coyne.

Dr. Conboy submitted a written detailed outline of a plan arrived at by his committee for the carrying on of rural dental inspection in Ontario.

Moved by Dr. McLaughlin and Dr. Eaton, that the recommendations of Dr. Conboy's committee, be presented to the Provincial Cabinet.—Carried.

A lengthy discussion followed in regard to the advisability or otherwise of trying to secure resolutions from the various Teachers' Institutes, regarding rural dental inspection, to present to the Provincial Secretary. It was finally decided to get in touch with the officers of the institutes in advance of the meetings, and secure, if possible, such resolutions.

Considerable discussion followed as to whether or not we should hold the Annual Conference.

Moved by Dr. Ellis and Dr. Seccombe, to hold the Conference as usual.—Carried.

Dr. Conboy was appointed to arrange for the interview with the Provincial Secretary.

Dr. Bothwell was appointed to arrange for the dinner.

Dr. McLaughlin was appointed to look after the motors.

It was considered advisable to again visit the Military Clinics, as several new features are to be found therewith.

Yours fraternally,

N. S. COYNE,

Secretary O.H.C.

PRO BONO PUBLICO

This Department is edited by FRED J. CONBOY, D.D.S., and will contain dental information in a form suitable for publication in the public press.

Members of the profession are urged to arrange, from time to time, for the insertion in a local paper, of the material appearing upon this page.

Why Teeth Decay

CLEAN teeth seldom decay. If the first set of teeth be properly cared for the roots will be absorbed normally, allowing each permanent tooth to take its rightful place in the mouth. If these in turn are kept clean by mechanical means, very few cavities develop, and the only way for them to give out is by the actual wearing away of the grinding surfaces. Not many people live long enough to wear out their teeth.

Our children are fed on soft, starchy foods, which require little chewing, and hence no mechanical cleansing. The gums become soft and flabby. As the teeth come through, particles of this easily decomposed food collect around and upon them, and soon become masses of acid-forming bacteria.

If these were removed at once they would do no great harm, but being allowed to remain, the acid attacks the enamel of the tooth, partially dissolving it, and a cavity is formed.

Once formed, this cavity collects food particles and more bacteria, producing more acid, which dissolves more of the enamel; this makes a larger cavity, which collects more food, bacteria, etc., until the pulp or nerve of the tooth is reached, and the child is brought with the toothache to the dentist.

One tooth after another becomes affected; some are extracted; others are so badly decayed that when the permanent teeth begin to form, they are deflected from their proper places. This causes crooked teeth, and the services of a specialist are necessary to correct malformations of the jaws and nasal cavity. The bacteria from the baby teeth are soon transmitted to the second teeth, and very often these are badly decayed before they are quite through the gums.

Parents who are not satisfied with the growth and development of their children, bodily, mentally, or both, should examine carefully the condition of the mouth and teeth. If the teeth are found decayed, out of line, or in any other than perfect condition, the chances are ninety times in every hundred, that the cause of the unsatisfactory condition of the child lies right there, and should be remedied at once. Taken in time, the remedy is easy and sure; and no parent has the right to condemn a child to go through life handicapped by conditions that are so easily corrected.

ACTIVE SERVICE ROLL

Complimentary copies of ORAL HEALTH will be sent during the progress of the war to all Dental Graduates on active service whose army address is known.

Honor Roll

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CAPT. J. R. DUFF, 79th Batt.
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LIEUT. S. G. ALDERSON, C.A.D.C.

LIEUT. H. J. MACLAURIN, 43rd Batt.
LIEUT. R. B. MCGUIRE, Brigade Corps.
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PTE. H. GREENWOOD, 76th Batt.
GUNNER OLIVER G. DARYMPLE, 67th Batt.

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†Director of Dental Services, address London. ‡Director of Dental Services, address Ottawa. *Lieutenants rank as Captains while overseas. C.A.D.C. overseas address—care of Director Dental Services. Canadian Contingents, Pembroke House, 133 Oxford Street, London, England.

of CANADIAN DENTISTS

ORAL HEALTH will appreciate receiving names and addresses or other information that will make these pages a complete Army Service Directory constantly available to every member of the profession.

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Capt. H. P. Thompson.	Capt. Karl F. Woodbury.	Lieut. R. Robillard.
Capt. L. A. Thornton.	Capt. C. E. Wright.	Lieut. P. H. Silver.
Capt. R. H. Till.	Capt. J. E. Wright.	Lieut. L. G. Smith.
Capt. H. P. Travers.	Capt. R. J. Yeo.	Lieut. A. E. Steele.
Capt. W. G. Trelford.	Capt. E. R. Zimmerman.	Lieut. C. N. Westwood.
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(Continued on next page.)

Active Service Roll

(Continued)

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Major Archie L. Johnson, 229th Batt.

UNDERGRADUATES—Overseas.

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J. W. Bartholomew, C.A.D.C.	A. W. Jones, C.A.D.C.	E. A. Reid, C.A.D.C.
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	R. J. Marion, C.A.D.C.	R. N. Webster, C.A.D.C.
		R. J. Whitaker, C.A.D.C.

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W. Hartlev, C.A.D.C.	J. R. McLachlan, C.A.D. C.	
R. Haryett, C.A.D.C.		

MULTUM IN PARVO

This Department is Edited by
C. A. KENNEDY, D.D.S., 2 College Street, Toronto

HELPFUL PRACTICAL SUGGESTIONS FOR PUBLICATION, SENT IN BY MEMBERS OF THE PROFESSION, WILL BE APPRECIATED BY THIS DEPARTMENT

TO PREVENT THUMB SUCKING IN CHILDREN.—Dr. George H. Henderson calls attention to a very ingenious method of preventing thumb-sucking suggested to him by Dr. Truman W. Brophy. Make a pasteboard cuff of the right size and length to slip on the arm, small enough not to slip off the hand. Sew cotton or other material on the edge to prevent it from irritating the hand. It can be bound with adhesive tape or straps and buckles. This will prevent any use of the elbow, and it is much more humane than the use of bitter drugs and other such expedients.—*British Dental Journal*.

DUPLICATING ORTHODONTIA MODELS.—Flake glue is prepared in thin chips about 1-32 inch in thickness—it is the glue which is used for duplicating plaster decorations on ceilings and statuary; the ordinary variety is not suitable for this purpose. A tin dish about 8 inches long, 4 inches wide, and 3 inches deep is the right size to contain two models and sufficient glue. An ordinary double boiler, the inside portion to contain about two quarts, completes the necessary apparatus. The inside portion of the double boiler is filled with flake glue, and sufficient cold water is then added to cover. This is allowed to stand until the glue becomes softened, usually about thirty minutes. Half of the water is then removed from the glue. Water is placed in the outer boiler, the two parts of the boiler are put together and placed over the flame. It is allowed to heat until the water in the inside boiler rises to the top of the glue. The double boiler is then removed from the flame, and the whole mass is allowed to stand until liquid, after which the inside boiler is lifted out of the hot water in the lower portion, and the glue allowed to stand until a scum begins to form on the surface, when it is ready to pour. The models to be duplicated are first thinly coated with vaseline and placed in a tin dish with the teeth presenting upward, and the glue is poured over them. The secret of the success of this process is to make the mass of glue liquid at the lowest possible temperature, then to pour it over the models at the moment in which it is still liquid, but beyond which it would congeal. If models have a tendency to rise in the liquid glue, they may be cemented to the bottom of the

pan with a little sticky-wax. The pan is allowed to stand in a cool place for at least twelve hours, after which the congealed glue is removed from the pan and the models are carefully lifted out by springing the glue aside. The glue impression is now ready to be poured with plaster of Paris. These models may be removed from the impression in ten minutes, but are set aside for an hour to allow the surface of the model to set, it being softer than ordinary models for the depth of one-quarter inch. The model is then retouched, and if desired several sets can be produced from the same glue impression.—*Internat. Journ. of Orthodontia.*

GUTTA-PERCHA FILLINGS.—Touch warmed gutta-percha, on its way to the cavity with oil of cajaput; on account of the increased stickiness of the gutta-percha so treated, the filling actually cements itself to the walls of the cavity. It may even be applied wet, and so is of real value in treating a patient in bed.

FRACTURES OF THE INFERIOR MAXILLARY BONE IN MILITARY PRACTICE.—From experience with a large number of cases, the authors have been led to establish a clinical division into fractures of the anterior group, in which the line of fracture is somewhere between the canines and the mid-line, and fractures of the posterior group, in which it is lateral to the canine. In the former group, the displacement is not sufficient to cause overlapping of the fragments; the teeth on the side of the fracture practically retain their normal relationship to the upper teeth, and the functional result, provided that bony union takes place, is not very bad. In fractures of the posterior group, on the other hand, a symmetry results from overlapping of the fragments. The chin is displaced toward the fractured side and the unaffected side appears more prominent, though regular in profile. Again, there may be abnormal prominence on the affected side, due partly to outward displacement of the short fragment, partly to swelling of the soft tissues, and perhaps partly to the presence of callus. Behind this prominence the profile appears flattened, owing to obliquity of the short fragment and disappearance of the angle of the jaw from the surface. An important sign of this variety of fracture is elicited by taking three points on either side of the jaw—the angle, condyle and mid-line and joining these by imaginary lines.—*L. Imbert and P. Real, Presse Medicale, per N. Y. Med. Journal.*

TAKING IMPRESSIONS WITH COMPOSITION.—When the compo is moulded properly on the tray, immerse the external aspect of the tray for a few minutes in cold water (this prevents the heated metal causing discomfort and sometimes pain to the lips), dry and dust surface of compo with fine quality French chalk and take your impression. This method gives very fine definition, the compo does not stick to the teeth, and the general result is a source of the pleasure to the dentist and his patient.

ORAL HEALTH

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Vol. VII.

TORONTO, NOVEMBER, 1917

No. 11

EDITORIAL

Canadian Dentistry and National Service

LAST month, under the above title, an article appeared in this journal, showing the acute shortage of dentists in the Dominion of Canada at the present time. The facts stated were laid before the National Service Commission and the Military Service Council, Ottawa, and assurance given that the members of the dental profession were ready and willing to serve in whatever capacity the authorities desired.

Under the terms of the Military Service Act of Canada, 1917, there will be called up for military service, one hundred thousand male British subjects, resident in Canada since August, 1914, from 20 to 34 years of age, and unmarried, or widowers without child. The selective system, having been adopted, the requisite number will be drawn from the above class, having due regard to the requirements of the essential activities of the country.

Exemption will apply to those who make application on special grounds, to be relieved from service, and who establish before a local tribunal (constituted under the Act), that they are entitled to a certificate of exemption. Exemption will in no case be granted

to a whole class or group of individuals in the community. Exemption will be granted only to individuals upon specific application to a local tribunal, and for sufficient cause. All certificates of exemption are in a sense temporary, and may, at any time, be renewed, varied, or withdrawn by the tribunal which issued it.

Every British subject within Class 1, who fails to apply for and fill in a report for service, or claim for exemption, within the time specified, will be liable to five years' imprisonment with hard labor. Every dentist or dental student in Canada, who is within the class named, should forthwith carry out the provisions of the Act in every detail.

If a practising dentist, conscientiously and unselfishly believes that he is rendering the most valuable national service of which he is capable in continuing to serve his local community as a dental surgeon, it is his bounden duty to apply for exemption upon the ground named in the Act, namely, "that it is expedient in the national interest that, instead of being employed in military service, he should be engaged in other work in which he is habitually engaged, and for which he has special qualifications." The local tribunals will understand and appreciate the local need for dentists, and will doubtless arrive at the wisest and best solution in the national interest.

In the case of dental, medical and veterinary students, the authorities have made special provision. To quote:

"The military representatives will not oppose a claim for exemption made by a medical, dental or veterinary student on the ground set forth in par. C. of section 11 of the Act. He will, however, agree to such an exemption, only with the proviso that the certificate of exemption issued to such a student, shall be a temporary certificate, expiring when the course which the student is attending is completed, and shall further be conditional on such student regularly following whatever course in military training is established at the institution which he attends."

"In every case, the granting of leave to complete professional training is based upon the understanding that men given leave are held for military duty."

In those cases where exemption has been applied for, but where the local tribunal decides not to issue a certificate, the dentist, or dental student, will commence training in the regular way, but will subsequently be transferred to the Dental Corps if, and when, his services are required in that branch. This will doubtless prove a very satisfactory arrangement, as every man, of no matter what corps, should receive sufficient military training to put him in the best possible physical condition.

The Good Health Movement

THE modern dentist is certainly an integral part of the Good Health Movement. If any member of the dental profession is practising without that *main objective*, he is practising without due regard to the importance of his work or the relationship between good teeth and good health.

A recent health survey of the employees of a large factory, proved that diseases due to infection were on the decrease, while diseases associated with the digestive tract and the eliminating organs, were markedly on the increase. Dental disease is a disease of the digestive tract and is primarily due to wrong feeding. A physician, who specializes in children's diseases, recently told the writer that 90 per cent. of his patients were ill because of improper feeding, and in most every case there was an over-indulgence in sugar. Doubtless a large percentage of the diseases of the digestive tract, in adults, is also due to faulty diet, including an over-indulgence in sugar; and in this category we must certainly include dental diseases.

In the interests of preventive dentistry, as well as good health, dentists should make their influence in the community felt, in favor of more simple and more wholesome diet. Thorough mastication also is one of those matters of benefit to the general health and of particular benefit to the teeth, and should appeal strongly to people to-day, in view of the war time necessity for the economic use of all food stuffs.

* * * * *

BY thorough mastication of food, people would eat much less, get just as much nourishment from the smaller quantity and avoid frequent digestive disturbances. Mastication is Nature's cleansing agent for the teeth and thorough chewing of the food is an important factor in the maintenance of the dental organs in a condition of health and cleanliness. The teeth, if they are to obtain their proper blood supply, need exercise just as much as any other part of the body.

By thorough mastication, a correct physiological flow of saliva is maintained simultaneously with the ingestion of food, and it is only under such conditions that the salivary secretion is thoroughly incorporated with the food and thus able to properly perform its normal digestive action.

Gum chewing, is but an artificial substitute for mastication. It is a bad habit causing an abnormal flow of saliva between meals, and if indulged in, throws the whole digestive process out of balance. Gum chewing is a mental distraction and should be persistently discouraged.

"Twice the chewing and one-half the sweets," is a splendid w

time motto for school children. The over-ingestion of sugar in its many different forms (candy, honey, jam, syrups, etc.), has much to do with the alarming prevalence of dental decay. Statistics recently gathered, show that while infectious diseases have been materially reduced, there has occurred a marked increase in diseases of the digestive tract, and much of this increase is doubtless due to the "bolting" of food, and over-indulgence in sugar.

It is a regrettable fact that since the outbreak of war, approximately fifty per cent. of rejected recruits have had to be rejected because of a defective condition of their teeth. In view of the role played by defective teeth in the general impairment of health and physical development, it must be apparent that no greater national service could be rendered than that dealing with the care of the teeth.

Encourage the boys and girls to save teeth, save health and reduce the high cost of living, by the more thorough mastication of food and less indulgence in sweets.

The Army Dentist

ANOTHER glimpse of the army dentist, this time behind the German lines, is portrayed in a recent issue of the Deutsche Zahnärztliche Wochenschrift: "Every regiment, or at least every division, must have its dentist, to whom a motor car is assigned. The automobile has on one side a detachable bracket table and on the other a folding dental chair, which can be detached likewise. An orderly of the sanitary corps who is a dental mechanic by trade is allotted to the dentist. On receipt of a telephonic or other summons, the motor car is driven to the place where it is required; here extractions, fillings, treatments and splints for jaw injuries are undertaken. Dental prosthetic work is done at the military hospital."

C.A.D.C. Dental Service Overseas

Headquarters, C.A.D.C., Room 45,
Pembroke House, 133 Oxford St., London, W. L.
October 16th, 1917.

Dental Operations Performed by Officers of the Canadian Army Dental Corps
in England, France and B. M. E. F., From July 1st to September 30th,
1917, and also showing the grand total of work completed
since July 15th, 1915.

Total operations reported to:	Fillings.	Treatments.	Den. tures.	Prophy-laxis.	Extrac-tions.	Devital-izing.	Total.
June 30th, 1917	384,741	111,301	74,572	43,565	297,697	43,459	955,335
July, 1917	31,467	15,056	6,635	5,977	15,334	2,845	77,314
August, 1917	30,131	14,149	6,505	8,925	12,788	2,439	74,937
September, 1917	31,940	14,955	6,314	8,639	14,576	3,148	79,572
Grand total	478,279	155,461	94,026	67,106	340,395	51,891	1,187,158

J. ALEX. ARMSTRONG, COL.,
Director of Dental Services,
O. M. F. of C.

ORAL HEALTH

A JOURNAL THAT STANDS FOR THE "OUNCE OF PREVENTION," AS WELL AS THE "POUND OF CURE"

VOL. 7

TORONTO, DECEMBER, 1917

No. 12

Permanent Establishment Canadian Army Dental Corps

THE Canadian Army Dental Corps has, until the present time, been operating under a Militia order covering the limited period of the war. Oral Health is glad to be able to publish herewith particulars of a new establishment covered by a General Order, and given public announcement as we go to press.

General Mewburn was appointed Minister of Militia and Defence in the Canadian Union Government. While Adjutant-General, he showed his appreciation and friendship for the Canadian Army Dental Corps, by having the accompanying General Order passed, improving the rank and status of the Dental Corps. The C. A. D. C. is now established upon precisely the same basis as every other permanent branch of the Militia.

General Mewburn has always recognized the value of adequate dental service for the army and has been a good friend to the C. A. D. C. from its inception. The Dental Profession throughout Canada certainly appreciates what General Mewburn has now done for the Dental Service in the Canadian Militia.

The Profession is also glad to know that Sir Edward Kemp has been appointed Overseas Minister of Militia, and it is fully expected, that as a consequence, the Canadian boys in France will now be given efficient and adequate dental service by the Canadian Army Dental Corps and Canadian dentists will be permitted to follow the Canadian troops over to France, in sufficient number, and with status that will make their work more efficient than under present conditions.

ORGANIZATION CANADIAN ARMY DENTAL CORPS C. E. F. IN CANADA.

Headquarters.

Lieut.-Colonel (Director Dental Services) 1

Hon. Captain and Quartermaster	1
Staff Sergeant	1
Orderly Room Sergeants	2
Quartermaster Sergeant	1
Corporal	1

Military Districts.

Lieut.-Colonels	6
Majors	12
Captains (Military Districts Nos. 1-13)	76
Lieutenants (Military Districts Nos. 1-13)	39
Honorary Lieutenants (Military Districts Nos. 1-13)	10
Sergeant-Major	1
Quartermaster Sergeants	10
Mechanical Sergeants	121
Corporals	10
Privates	123

Appointment to Units.

One Dental Surgeon to every 500 men in the District, and one or more Dental Surgeons as circumstances may require, is to be attached to District Staff, and whose services are to be utilized in connection with units whose numbers do not reach the requisite number to permit of a dental surgeon being appointed to them.

Convalescent Homes.

1 Dental Surgeon to every 150 beds.

Military Hospitals.

One Dental Surgeon to every 500 beds (with mechanical sergeant and privates).

NOTE.—Dental Surgeons who have practised their profession for two years or more are to be appointed with the rank of Captain; those under two years, with the rank of Lieutenant. Lieutenants who have been in the Corps for one year may be promoted to the rank of Captain. Dental Surgeons for Convalescent Homes will be exclusive of establishment provided for above.

Will be Centenarian on 13th

THE readers of Oral Health are asked to send a message of congratulation and good cheer to Dr. Jessica Greene, Westchester, Pa., who will attain the age of 100 years on December the 13th, 1917.

This request was made at the recent meeting of the N. D. A. Kindly make a note of the date and do not fail to convey to Dr. Greene your good wishes upon his attaining such an honorable old age.

bar Campbell, of Kansas City, endeavors to prove that "measurements of the mandible, tracings of the Condyles, the construction of hypothetical triangles, and the use of the face bow are all non-essential in the construction of dentures possessing the highest degree of efficiency." He was ably supported by Dr. Rupert E. Hall, of Chicago, and Dr. Martin Dewey, of Chicago. They claim that the tactile sense of tooth cusps controls or at least guides the movements of the mandible.

Now what shall we conclude from these diversified opinions? Most general practitioners have not the opportunity to make exhaustive experiments in every branch of Dentistry. We look to the Professors in our Colleges, the Scientists in the laboratories of our Research Institutes to draw conclusions that will permit us to gather right conceptions. It is mighty important for the preservation of human life that these differences of opinion should cease. We must give much of our clinical findings, but these Laboratories of Research must digest our findings that we may be able to properly assimilate the essentials.

But, whether or not these controversies cease, we must not forget the necessity of individual effort to master the Pathology of Dental Tissues and to perfect our technique; if necessary to do so, each must specialize in his own favored branch. But, on the other hand, we must not specialize until we become too narrow and thus lead to more unsettled controversy. If the mind is too long focused on one objective we lose our proper perspective.

Dr. E. C. Rosenow, Rochester, Minn., made this statement: "I believe that teeth can be devitalized, the roots filled and no infection follow, *but* this operation must not be performed in the careless, wholesale manner of the past. Determine not to devitalize teeth without the deepest consideration, and if you do so, then treat them with the utmost care."

Dr. Thomas B. Hartzell impressed upon us that bacteriologically clean mouths would save thousands of lives each year. The streptococcus viridans is usually found in granuloma of the teeth; the same streptococcus is found in masses in heart lesions; over one hundred and five thousand people died last year in the United States of heart disease, while only ninety-eight thousand died of Tuberculosis. Ninety per cent. of these heart lesions are caused by streptococcus viridans. Therefore Dr. Hartzell concludes that if fifteen minutes a day were used from childhood to old age in proper dental attention, then those hundred thousand human beings would live.

Surely, then, we should have no controversies over the essentials, and let this watchword continue—Prophylaxis! Prophylaxis! Prophylaxis.

The Oral Hygiene Convention of the Ontario Dental Society, Held at Toronto, November, 1917

J. A. BOTHWELL, D.D.S., TORONTO.

THE various members from the Province met at the College at 1.30, and were driven to the Parliament Buildings, where they were presented to Premier Hearst, the Provincial Secretary and the Deputy Minister of Education.

The speakers, Dr. Wallace Seccombe of Toronto, and Inspector Taylor of St. Thomas, were introduced to the members of the Government by Dr. Fred Conboy, who complimented the Government on its sympathy and interest in educational work in general and dentistry in particular.

Dr. Seccombe laid great stress on the value of the man power of the nation as it exists to-day, the importance of its conservation at this particular time.

He stated that the Boards of Education now have power to have dental inspection and clinics, but that what we want and need now is co-operation and more co-ordination with the Departments of Health, Education, and the Women's Institutes, together with organized leadership. That dental disease is primarily a child's disease, as from 80 to 90 per cent. of the children are affected.

He said that the plan we desire to put before the Government is the need for the appointment of a chief inspector (with two assistants for field work), with offices in the Parliament Buildings. The field work to consist of the examination of children—parents' notification—lectures to teachers, parents and Women's Institutes. The scheme provided a man on hand at all times for lectures and to give instruction as to the mouth and general health preservation, as mouth infection produces general disease, and a great many heart lesions result. The dental disease is the most serious in the world to-day and we should institute immediate plans to educate and prevent its spread.

Inspector Taylor complimented the Government representatives on the improvements in education, i.e., abolishing of model schools and laying more emphasis on normal school and university education—the increase in teachers' salaries, resulting in more permanence in the profession, thereby uplifting it—also the introduction of the superannuation scheme, and the fact that they were continually passing progressive, educational legislation.

Mr. Taylor's slogan was "Give the poor boy and girl a chance." Backwardness in children is due to some physical defect—Medical Science to-day is protecting the weak—the State is no stronger than

its weakest individuals—100,000 men were rejected in Canada for trench warfare, because of unfitness.

He further said the laws of health were being violated by: 1. The quest of pleasure; 2. The Midnight hour; 3. Fast eating. The hygiene instituted by the Government is tending to prevent this waste—we must get back to the “simple life.” If the militia requires a physical standard, the State should examine all children both medically and dentally. The Normal School teacher is required to meet a physical standard, why not the child, so as to better stand the strain of the present school system which puts children through school faster than in former days. Boys and girls to-day leave school at 9 or 10, where it formerly was 14 or 15 years. He dwelt on the fact that to-day there is too much *teaching* and physical disability is produced thereby. We should keep them in school longer so they may be more able to meet the unequalled economic conditions as they come after the War. The child should be made advantageous to the State, the Mercantile and Industrial World, the Army, Navy and the Government—an efficient child is essential.

Dr. Conboy closed the addresses by thanking the representatives for their hearing.

Premier Hearst in replying expressed himself as indebted to the dentists for what had been said, regretting the absence of the Minister of Education, but promised to place the request before the Cabinet, the officer of Public Health, and the Minister of Education, it being the duty of the Government to fit boys and girls for the future, as the strength of the country depends on the health, both physical and mental, of the boys and girls, and the manhood and womanhood.

He, however, advised proceeding carefully and cautiously, so as not to precipitate a strong public opinion against it. For the present the legislation of the Province was sufficient, and it was not feasible to force dental inspection without favorable public sentiment to back it. He promised that consideration would be shown to what had been said to-day.

The balance of the afternoon was spent in visiting the Davisville Orthopedic Hospital for returned soldiers, and the Base Hospital for the soldiers of this division. The dental clinics in these institutions were particularly interesting—some of the work done for returned men being shown. The Military men are to be congratulated on the fine showing the clinics made, and the quality and class of work that is being done.

At six o'clock, forty-six men enjoyed a good dinner at the Walker House, after which Dr. R. J. Reade, Chairman, spoke about the visit to the Parliament Buildings and the encouragement received. He then reviewed the history of the Oral Hygiene Organization.

A committee was originally appointed on April 30, 1909, by Dr. W. J. Bruce, of Kincardine, at which time the large sum of \$10.00 was set aside for the expenses of the committee, as against \$200, to-day's amount.

The committee at that time outlined the scope of the work as follows:—

- 1.—Lecture courses.
- 2.—Literature.
- 3.—Means of personal education.
- 4.—To maintain and advance the status of the profession.
- 5.—To provide a means for the care of the poor.
- 6.—To provide for the examination of all school children.

The above work consisted of lecture courses, pamphlets being distributed, organization of large centres, examination of all school children. Now dentists are allowed to sign sick certificates for school teachers.

In 1910 The Ontario Education Association asked the committee for a lecture—Dr. R. G. McLaughlin delivered same—as a result the treatment of poor children in Toronto was taken up, facts and figures presented to the Boards of Health and Education, and in consequence we to-day have a large organization under Dr. Wallace Seccombe, doing a splendid work.

Dr. Conboy, the speaker of the evening, presented his “sermonette” as he called it, in a very delightful and oratorical manner. He first wanted to prove that *Rural* dental inspection was necessary, and, second, that it was the duty of the men present to see that we get it. His text was “Breathes there a man with soul so dead, who never to himself hath said, ‘This is my own my native land.’”

In substance he said that every man leads a dual life—we are not all a Dr. Jekyll and Mr. Hyde, but every man has a private or home life, and a public or state life. He has a duty to his family and a duty as a citizen to the State. Every man should be patriotic and should cultivate a love of country, love of soul, love of fellow citizens, love of law and government. We all love our fellow dwellers on the earth because we sacrifice for them. Thousands, yes, hundreds of thousands have left home and everything dear to struggle and fight for the liberty of others. Think of the man with every pleasure at his hand, leaving it for weariness, dust and toil of war, with the likelihood of never returning, and if so with disease and destitution. They did it for others. We are here in safety and comfort. What is our duty? Canada is only as good as the boys that are left.

There are many destructive forces—among them diseased teeth and mouths. Our duty, our business, is to stop the ravages. Our Government is responsible, but *our* responsibility is greater—Dental disease is a menace to the people of this country. Dental inspection

is a remedy for this evil, and it is our duty to secure this inspection.

The nation's greatest asset is its children. Instruction by the inspector, followed by the teacher and parent, will educate the children, will help prevent decay and avoid pulp destruction. Early publication of results obtained will lead municipal authorities to establish free clinics.

Bad teeth produce ill-health and lowered resistance, and become disease carriers, and upset the alimentary canal. Many secondary infections are produced by local foci in the mouth. We must guard the portal of life and death. Seventy-two men die every hour of preventable diseases in the United States. Men age and die before their time as a result of disease—animals live longer than men.

We should have better educational progress—defective eyes, ears, mouth and nervous systems seriously handicap the boy of to-day. A boy must think, remember, imagine and sensate accurately. He cannot concentrate if in pain, or if he has a diseased body. One development of a sub-normal brain is the result of nerve pressure. Two or more decayed teeth means months longer at school. A sound mind in a sound body is as necessary as ever—Weak minds would be better if the body was strong. We are known by the company we keep—we are known by the teeth we keep. Endurance, ability and reliability go hand in hand, and the boy or girl weak mentally is handicapped.

Infection means morose thoughts, and the boy or girl becomes a truant and thinks of persecution. The boy with a weak will power gives way to temptation, where with physical defects removed, he improves and makes good.

Rural inspection is a good thing financially. It means less cost to the individual, the State and industry. Regular inspection means small cavities, less pain, less money, less time and more healthy mouths. Diseased mouths are caused by neglect, and children with these diseased mouths become laggards at school—twenty per cent. (20%) of the school income is spent on "repeaters." Absences are due to toothache and associated diseases. The poor become wards of the State—they become physical, moral and mental weaklings, and are lost to the State.

We have factory inspectors to safeguard employees—we have county inspectors and instructors to look after the Holstein cow and the Tamworth hog for the farmer, an M. O. H. to look after sanitation, pure water, etc., but no dentist to instruct the public in the care of unsanitary mouths. **WE MUST PROTECT** our people from the ravages of dental disease, and the way is by regular inspection, and that is an immediate necessity.

Dean Webster in his talk congratulated the speaker of the evening, Dr. Conboy, on his excellent address, particularly the preliminary part of it.

He said that the Oral Hygiene Committee was brought into existence when the Ontario Government were preparing their book on Hygiene for the schools. He contended that the Department of Education, Department of Public Health, Department of Agriculture, and Departments of Professional Education, such as Law, Medicine, Dentistry and Veterinary Science, should all be State controlled as a non-political institution. Medical inspection should be under the Board of Health, which should be under the Department of Education—that the Department of Health has two duties, police and education, and the large part of the work is educational.

Inspector Taylor was indeed glad to hear the address of the evening, saying it was exclusive and inclusive—the audience added *conclusive*.

The great problem of the day, is to get the people to think that a child is as important as a Holstein calf or a Tamworth hog—then we will get dental inspection. “Put not your hand to the plow and look back.” Education is a plant of slow growth. A period of reconstruction is coming—War is making the situation good, and the people are getting ready for anything that makes for better boys and girls, men and women. Every child’s health is an asset or a liability. We must have policemen or teachers, penitentiaries or schools. Our duty is to go home and start our propaganda to-morrow. Traditions, customs, and habits have to be fought—they die hard. Boys pass from the log school house to passable men or shining lights and make trade marks on the pages of history.

We should work first with the Women’s Institute for it hits the home and changes the personnel of the schools. The women of to-day are responsible—there should be women’s votes everywhere, and women on the school boards.

Secondly, we should work with teachers’ institutes with a representative in each local constituency.

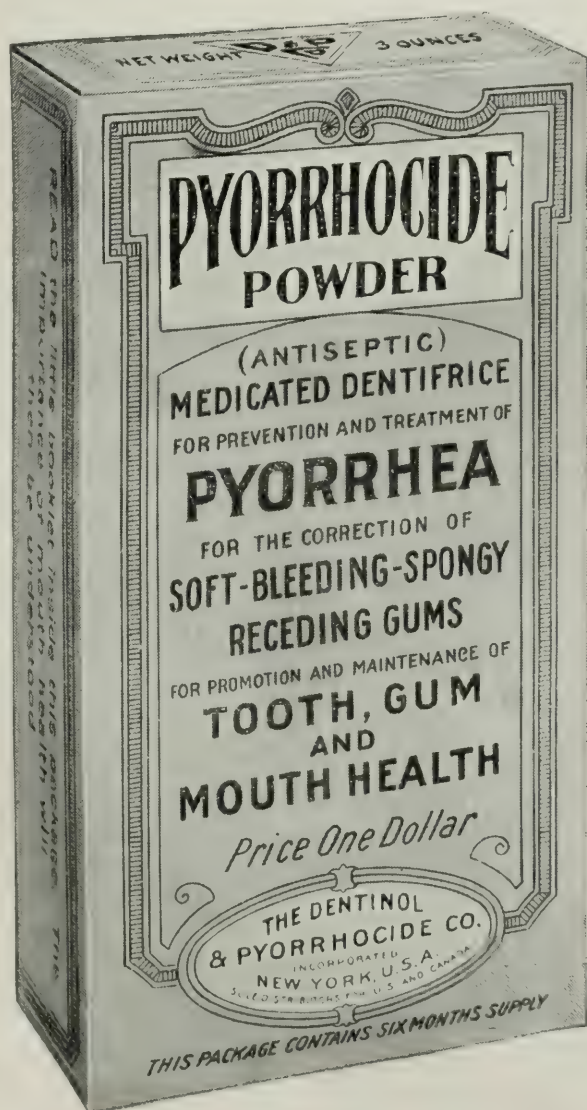
The new education is vocational, industrial and physical—body, soul and spirit.

Short comments on the work of the day and evening were made by the inspector from Halton County, Dr. Hicks, of Chatham; Dr. R. G. McLaughlin, of Toronto, and Dr. Bennett, of St. Thomas.

The following were present at the convention: —

Capt. H. S. Thompson; Capt. F. W. Barbour; Capt. H. A. Semple; Lieut.-Col. W. Thompson; Inspector J. A. Taylor, St. Thomas; Inspector J. M. Denyes, Milton; Drs. W. A. Black, J. S. Simpson, Trenton; W. E. Willmott; J. A. Bothwell, Stratford; A. J. McDonagh; W. T. Ganton, Uxbridge; R. M. Stewart, Markham; Arthur Ellis; G. A. Liscumb, Drayton; G. V. Fisk; F. R. Watson, Georgetown; D. Baird; R. W. Hoffman; C. R. Col-lard; H. F. Kinsman, Sarnia; J. E. Middleton, Peterboro; C. A.

Success in Pyorrhea Treatment Is the Result of Two Co-ordinating Forces —the dentist and the patient.



The irritating causes of pyorrhea . . . deposits, malocclusions and faulty mechanical work, must be removed or corrected by the dentist and the infected tissues restored to normal health.

The patient must keep his teeth and mouth clean—he must aid the dentist in repairing the broken down gum tissue.

As the kind of work done by the patient is a factor in the treatment of pyorrhea, the importance of an effective medium for the patient's use is emphasized—it must clean and polish the teeth—it must aid in healing diseased gums. Pyorrhocide Powder is effective. It is medicated with Dentinol.

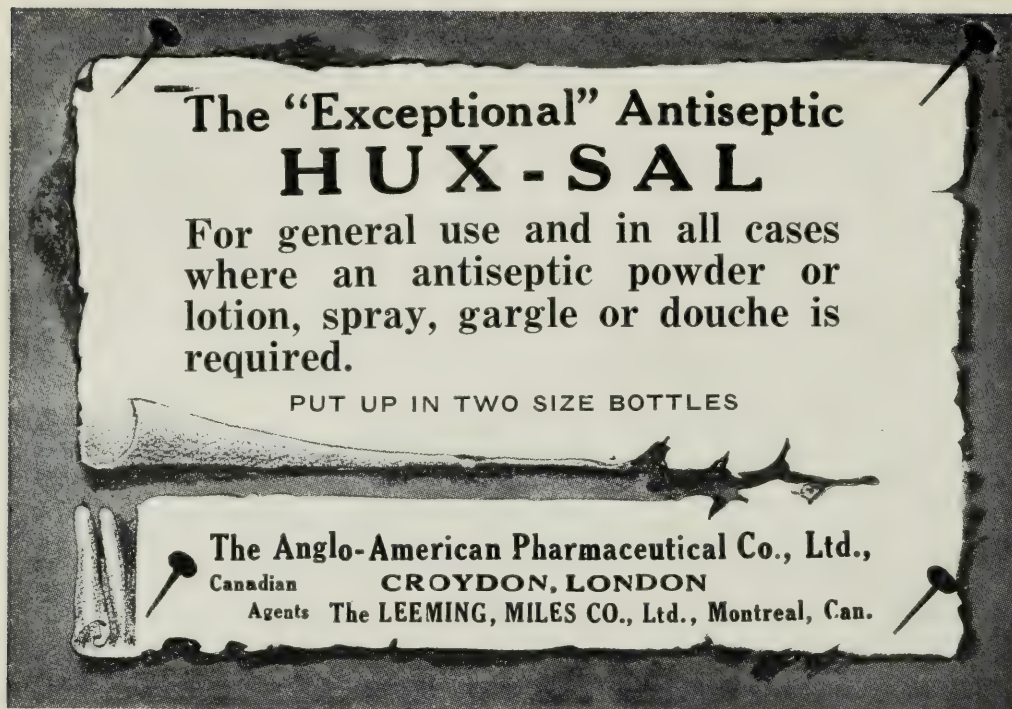
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MAJOR-GENERAL, THE HONOURABLE S. C. MEWBURN, C.M.G.,

Minister of Militia and Defence.

The National Dental Association

THE NATIONAL DENTAL ASSOCIATION is now of age,—it has celebrated its 21st annual meeting. Members and guests assembled in the City of New York during the last week of October, to the number of 5,500 and of these over 50 registered from Canadian Provinces. And what a wonderful celebration it was! At times the numbers were so great that the convention seemed to become almost unweildy, but through it all the local committees and officers handled their very difficult task in a remarkable way.

Among those present from the Dominion of Canada were the following:—

Lieut.-Col. Thompson, Major Thomson, Capts. Barbour, Mallory, McLaughlin, Johnson, Brown; Drs. Beckwith, Ryan, Hennigar, Rice, Dubeau, Gendreau, Jack, Stevenson, Berwick, Wightman, Amy, Capon, McLean, Pearson, Box, Seccombe, Coram, Webster, Zinkan, McDonagh, Ross, Loughheed, Williamson, Moore, Thomas, Garvin, Hoare, Jones, Johnson, and McDonald.

Root Canal Operation Controversies

EMERY JONES, D.D.S., NEW WESTMINSTER, B. C.

THE twenty-first annual session of the National Dental Association was held during the week of October twenty-first, at the Hotel Astor, New York City. No more suitable setting could have been chosen than this magnificent Hotel, with its spacious halls and commodious ball rooms. More than five thousand Dentists were gathered there from all parts of the United States and Canada.

With so many essayists and clinicians, it is not surprising to find diversified opinions regarding the theory and technique of the several specialties of Dentistry. But, to the thousands of Dentists who were there to listen, to learn, it seems deplorable that there cannot be presented more scientific facts and fewer half proven conclusions, several of which were so widely different as to be almost in direct opposition.

Dr. Elmer S. Best, of Minneapolis, considers it good practice to use Sodium-potassium compound or Sulphuric Acid in gaining access, or enlarging fine canals. He also considers that Tricresol-Formalin can be used to advantage if sealed in the pulp chamber. In filling roots that have previously been infected, he believes it wise to fill beyond the apex, and where possible to encapsulate the end of the root.

In opposition to this theory, Dr. Fred Gethro, of Chicago, em-

phasized the advisability of not filling any roots beyond the apex. He does not advise the use of Acids in enlarging the canals, because of the danger of injury to the apical tissues, and believes the canals can be satisfactorily enlarged with files and barbed broaches.

Dr. Meyer L. Rhein is an earnest advocate of forcing the root filling beyond the foramen providing the apex is denuded of peridental membrane. If the cementum is left exposed to the action of the osteoclasts, absorption may follow. The streptococcus veridans, so commonly found in the granuloma, though incapable of producing pus, produces toxins even more virulent. These organisms may be destroyed by Ionization, but others will replace them if there is left a suitable media for their development. Therefore encapsulate the denuded apex with chloropercha and thus make it armor proof.

Dr. Weston A. Price, of Cleveland, states that few of us have ever sterilized a tooth in the mouth. The medicaments, commonly used do not sterilize the dentine, much less the cementum. Nine-tenths of the electric current used in Ionization is expended on healthy tissue and only one-tenth on the pathological. Yet, the majority of essayists speak with great confidence of their favorite methods of "sterilizing" the tooth. He reminds us that a condensing osteitis may be just as much a source of infection as a rarefying osteitis. Let us not place too much dependence on our radiographs until we are competent to interpret them. Remember that a positive picture means something if properly interpreted, but a negative showing does not necessarily indicate healthy apical tissue.

Dr. Carl J. Grove, of St. Paul, Minn., has made exhaustive experiments with Tricresol and Formalin in root canals and has proven to a vast number of dentists that such drugs should never be used in the treatment of putrescent pulps, in spite of the fact that Dr. Buckley's friends have so earnestly advocated its use. Dr. Grove also shows by numerous observations that more rarified apical areas follow the overfilling of canals than are observed in the underfilled.

Ionization is also a bone of contention. Dr. Fette, of Cincinnati, and Dr. George C. Sharpe, of Pasadena, Cal., believe it should have a very prominent place in carrying medicaments into the apical tissues and destroying the organisms found there. But the consensus of opinion on Ionization seems to have been well expressed by Dr. Elmer Best, when he said: "Though I am using it every day, I am not prepared, yet, to express an opinion of the results."

I might mention many illustrations of contradictory teaching in other branches of Dentistry, but one other will be sufficient. For several years many of us have been earnest students of the Prosthetic teaching of Professor Gysi and Dr. Geo. Wood Clapp, and now when we have carefully mastered that technique, Dr. Dayton Dun-

Snell; A. A. Hicks, Chatham; F. E. Bennett, St. Thomas; C. A. Kennedy; E. W. Paul; G. G. Jordan; W. E. Wray; H. E. Eaton; W. Seccombe; R. G. McLaughlin; R. J. Reade; F. Conboy; J. A. Bothwell; Geo. Grieve; E. A. Hill, Sudbury; R. C. Davis, St. Catharines; A. E. Webster, F. Husband; J. A. Marshall, Belleville; J. E. Rhind; W. C. Trotter; T. S. Campbell, Galt; C. E. Stewart, Elmira; N. S. Coyne.

The Preparation of Roots, Copings and Dowels

I. H. ANTE, D.D.S., TORONTO, ASSOCIATE PROFESSOR
PROSTHETIC DENTISTRY, ROYAL COLLEGE OF DENTAL
SURGEONS.

THE success of crownwork and the degree of permanence in the operation, combined with the esthetic results obtained, depend upon, a clear observation of the requirements from a physiological, anatomical, mechanical and esthetic standpoint.

In the entire subject there is probably no one distinctive feature of such importance as the practical, scientific, and skilful preparation of the remaining crowns or roots of teeth for the reception of artificial crowns. By this preparation it is not meant simply the mechanical trimming for the reception of the band or coping, but the removal of the pulp, the cleansing and filling of the root canals.

While the therapeutic treatment may be arduous, the operation and mechanical requirements are all equally exacting, and demand the same degree of care and accuracy that would be essential to the preparation of the foundation for a superstructure of permanency and usefulness.

The common and exciting cause of gingival inflammation, periodontal and alveolar absorption and the absolute loss of many teeth can, invariably, be traced to faulty and imperfect adaptation of artificial crowns.

As clinical experience proves that comfort and permanency depend upon a conservation or reproduction of the natural conditions, such liabilities decrease in proportion to the degree of accuracy observed in the operative procedure. As accuracy may only be obtained by an appreciation of the important requirements, an understanding of the underlying mechanical principles and a conscientious execution of the details is necessary.

The employment of artificial crowns is indicated in extensive loss of tooth structure from the ravages of caries, accidental causes, discoloration, impaired function, malformation and malposition. There should always be enough tooth structure remaining to secure sufficient anchorage.

Assuming that the surgical and therapeutic treatment of the teeth

has been properly carried out, the success of the work depends upon the operative and mechanical preparation of the teeth for the reception of the bands, copings, caps and dowels.

The principles involved in the necessary preparation of the roots are governed by the particular style of crown indicated, which in turn is governed by the stress subjected in different directions according to their location in the arch, which fact demands that the construction and application of artificial crowns should be made with a view to affording a degree of resistance sufficient to secure the greatest integrity of both.

In the upper anterior teeth the stress imposed is to force them upward and forward. In the lower anterior upward and inward; in the bicusps the stress is received in both vertical and lateral directions. The molars are least susceptible to displacement, as the lateral stress is limited in proportion to the degree of the normal accuracy of occlusion; and as the greater stress is in the direct or vertical line.

While crownwork is divided into two general classes, namely, the shell crown and the dowel crown, the variation in the essential details of their individual construction requires that each class be subdivided and considered separately.

It being impossible to cover the whole subject in one paper, the writer will, with your approval, consider the preparation of roots for the reception of the dowel crowns.

REMOVING CORONIAL PORTION.

In the operative procedure incident to removing the remaining portion of the natural crown, as much of it as possible should be cut away and broken down to a certain point in order to avoid all unnecessary grinding. This may be quickly and easily accomplished by undermining the remaining crown, by cutting grooves, from mesial to distal, about 2 mm. from the gum line on the labial or buccal, and about 4 mm. on the lingual surfaces. This is best accomplished with small knife-edged stones, half-inch, five-eighths, three-quarters, in the straight handpiece for anterior ten teeth, and in the right or contra angle for the molars. Fig. 1, A

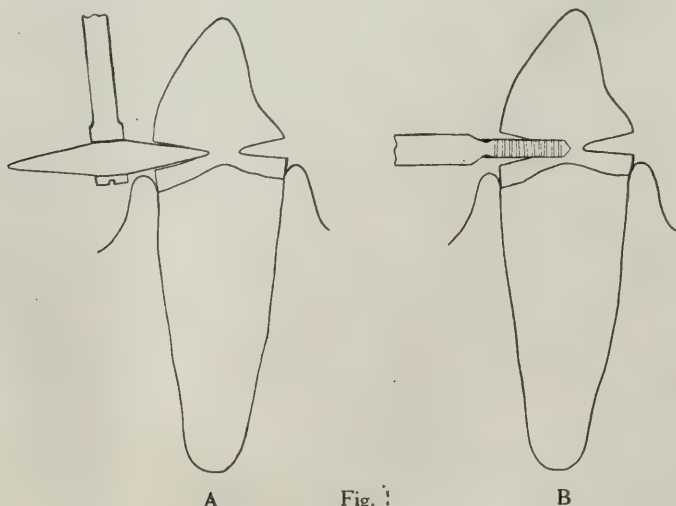


Fig. 1

To facilitate the excising, the use of a small fissure burr (No 558) is inserted into these grooves on the lingual and labial surfaces, and the continuity between the walls destroyed. Then the remaining portion of the tooth can be removed without shock or danger of fracture, by placing the beaks of the excising forceps in the grooves, and a slight pressure exerted. Fig. 1, B

PREPARATION OF CANAL.

Presuming that the root canal has been enlarged, thoroughly sterilized, and is ready for the root canal filling, if intended to be used as an attachment for a dowel crown, it is necessary to fill only a portion of the canal. Short gutta percha points or rods are used, and these are packed tightly into the canal, filling about 4 or 5 mm. of the apical end.

The preparation of the canal for the reception of a dowel is of special significance, since the dowel plays such an important part in the retention and stability of the crown.

It should be enlarged sufficiently to receive a dowel proportionate in size with the diameter and probable length of the root, and consistent with the requirements of the crown. Any further destruction of tooth tissue is unnecessary.

One dowel is sufficient to support any crown, providing it may extend into the root a depth equal to or at least two-thirds of the length of the crown to be restored, and possesses strength enough to withstand the stress. In molars and upper first bicuspid roots, the canals being constricted, and owing to their divergity, making it impossible to insert dowels long enough, two or more may be used.

After determining the size of the dowel indicated in the individual case, the canal should be enlarged to receive it, taking into consideration the exact length of the root so as to know just how far it will be safe to go.

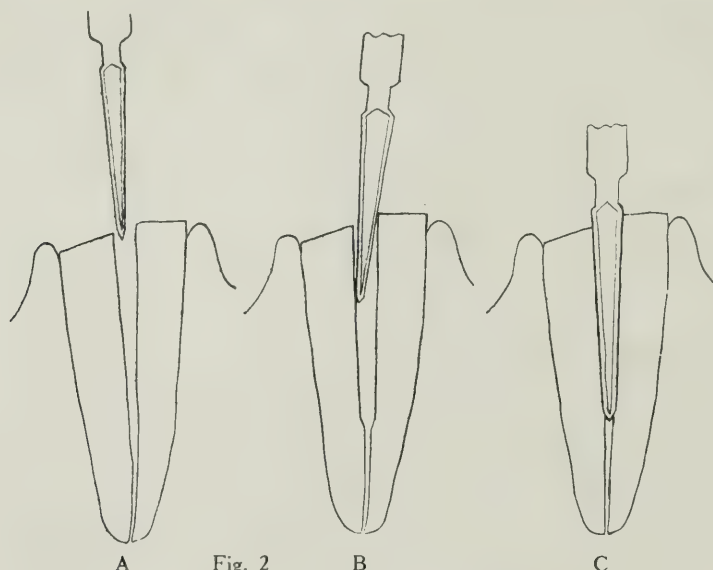
When enlarging canals, none but safe ended instruments should be used, as there is danger of perforating the side or end of the root; twist drills, Gates Glidden drills, root reamers of different makes will follow the canal and enlarge it, but will not cut at the end.

Select a reamer slightly larger than the canal, insert, and with a very light pressure allow it to work its way up into the canal, withdrawing frequently to clear it. It should not be forced, but pressed frequently until the desired depth has been reached. This reamer is followed with the next size larger, and so on until one approximating the same diameter as the dowel is finally used, and the canal reamed out to adequate proportions. Fig. 2, A

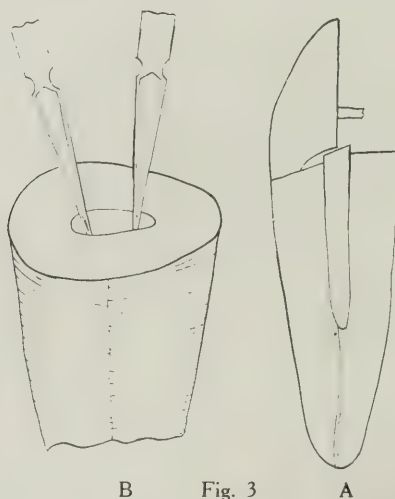
In some cases it is desirable to extend the opening into the canal somewhat lingually in order to carry the projecting or surplus end of the dowel out of the way, thus allowing plenty of room labially, to adjust the neck of the facing to proper relation. This is secured by partly withdrawing the reamers and sloping them lingually, thus en-

larging the canal at the basal end, at the expense of the lingual half of the root. This is especially indicated with porcelain facings.

Fig. 2, B, Fig. 3, A



When ready to wear, and porcelain crowns are to be used, the canal is simply enlarged in the original direction so that the dowel will sit directly in the centre of the tooth. Fig. 2, C



Canals that are constricted mesio-distally, are enlarged to conform with their anatomical form. Small reamers are used, and when reaming out the canal they are guided from side to side with a swaying motion, thus producing a narrow but long opening in the root canal. (Example upper second bicuspid.) Fig. 3 B

THE DOWEL.

A dowel is a piece of material fitted into two adjacent pieces to fasten them together.

In roots which are even with, or approximating the gingival line, attachment must necessarily be made by inserting a dowel in the direction of their longitudinal axis. If the dowel selected is of a size

proportionate with the size of the root and requirements of the crown, and then attached to the root and crown, such a mechanical fixation will practically exclude the loosening of the parts at the line of junction, overcoming leverage at that point by distributing it throughout the length of the root, and thus forming a means of anchorage.

REQUIREMENTS OF THE DOWEL.

- (1) It should conform to the anatomical form of the root canal.
- (2) It should fit closely to the walls of the canal throughout its entire length.
- (3) It should extend into the canal a depth equal to the length of the crown to be restored.
- (4) It should possess enough strength to withstand the stress to which it will be subjected.
- (5) It should be constructed of a material that will not corrode or disintegrate from the action of cement or fluids of the mouth.

As the dowel assumes the greater portion of the stress to which the crown will be subjected, the alloy of platinum and iridium or gold and platinum are generally used, because of its toughness and strength. (The former preferred.) The round and square wire in sizes varying from 12 to 18 gauge, are prepared for this purpose.

Other alloys are used for dowels, platinoid, German silver, nickel silver, gold and nickel, but the only advantage possessed by them is that of economy, and this is gained at the expense of stiffness, strength, permanency and root discoloration.

If there is any preference as to the form of wire used, it is in favor of the round.

ADVANTAGES.

- (1) Easier to remove from the canal after mounting.
- (2) Ease with which the canal is prepared for same.
- (3) Much larger gauge may be used in the same size round canal as would admit the square.
- (4) It conforms more favorably to the anatomical form of the root canal.
- (5) It requires the least amount of tooth destruction.

DISADVANTAGES.

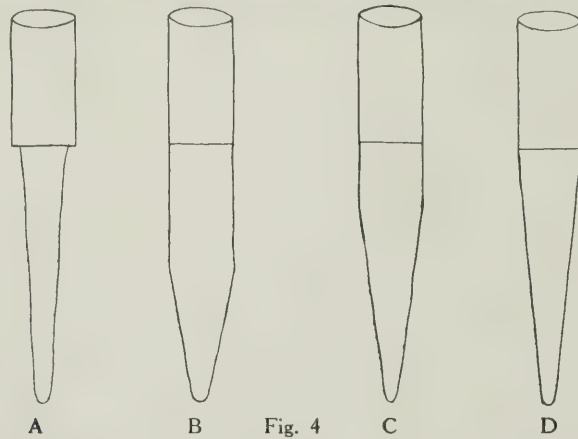
It does not prevent rotation of the crown.

There can be no rotation if the wire used is of adequate size, and the crown and dowel are well adapted, and the mounting secure, nevertheless it may be overcome in the round dowel by squarely tapering the apical end.

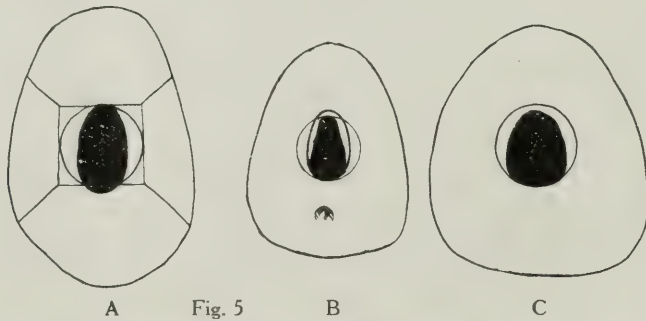
For long, thick-rooted teeth, as cuspids, upper centrals, the apical half is tapered. For narrow-rooted teeth, as lower incisors, upper laterals, the apical three-quarters, or the full length, may be squarely tapered. Fig. 4, B, C and D; and Fig. 5, C.

In the canals of the upper laterals, second bicuspid and the

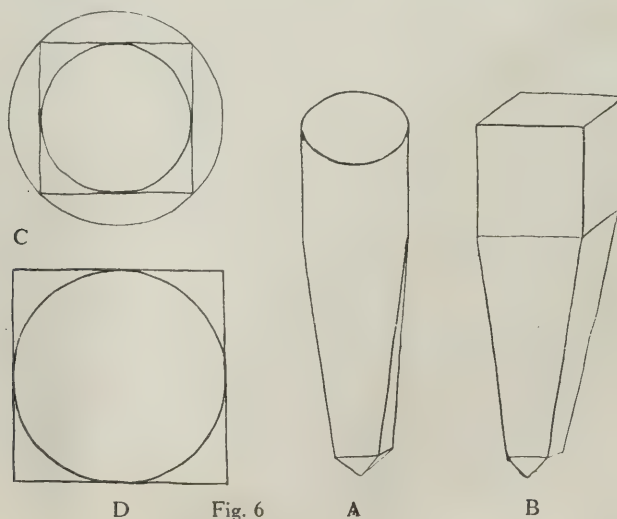
mesio buccal of the molars, owing to their flatness or mesio-distal construction, the dowels should be flattened somewhat so as to conform more favorably to their anatomical form. Fig. 4, A, and Fig. 5, B.



In fitting the dowel to the canal, a length should be cut which will afford about 4 mm. of surplus when a porcelain crown is to be adapted, and about 2 mm. for facings.



To squarely taper the dowel place it in a pin vice, the free end placed upon an iron block, and with a light hammer flatten out one side, then give it a quarter turn and flatten out the other side, repeat and gradually draw the end to a square taper. It may also be ground on a lathe stone, but the former method saves material and is effective. Fig. 6, A and B.



Comparative fit of dowels, using for illustration a 14-gauge round hole. This will admit a 14-gauge round dowel, but will admit only a 16-gauge square. Fig. 6, C.

Now take a 14-gauge square hole, this will admit a 14-gauge square, and will also admit a 14-gauge round, but in order to prepare a 14-gauge square hole, you have sacrificed more tooth tissue, and thereby weakened the root in four places. Fig. 6, D. Fig. 5, A.

The length and size of the dowel is the most important factor. It should extend into the canal to a depth equal to and not less than two-thirds of the length from cervix to incisal or occlusal edge of crown to be supported, and of sufficient diameter to withstand the stress to which it is subjected. Fourteen-gauge round for the upper centrals, cuspids, second bicuspid and palatin canal of the molars, and on the lower cuspids, bicuspid and distal canal of the molars. Fifteen-gauge is used for the upper laterals, two canals in the first bicuspid and buccal canals of the molars, and in the lower incisors and mesial canals of the molars. Fig. 7

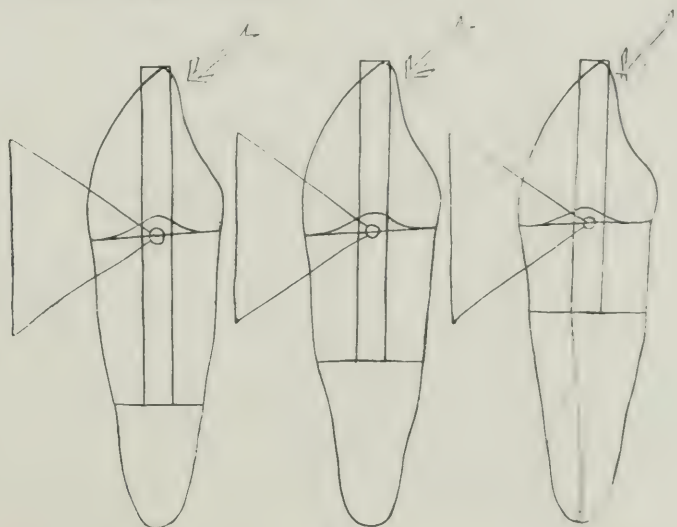


Fig. 7

SEPARABLE AND INSEPARABLE DOWEL CROWNS.

The Separable Dowel.

The feature of this class of crown embraces a removable dowel, which may be previously mounted in the root, and to the projecting end of which the crown may be subsequently attached. They are designated for the purpose of facilitating the adaptation of the crown to the root. Examples: Davis, S. S. White, Justi, etc. Fig. 8.

The Inseparable Dowel.

This class of crown embraces the feature of an inseparable dowel which is baked in or otherwise securely attached to the porcelain, and forms an integral part of the crown. Examples: Logan and Twentieth Century, etc. Fig. 9.

Disadvantages of Separable and Inseparable Dowel Crowns.

- (1) Difficulty of obtaining a crown of same diameter as root.

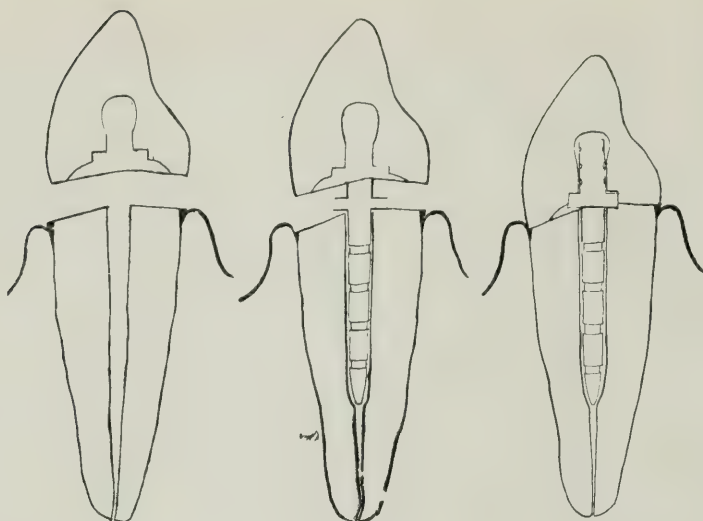


Fig. 8

(2) Difficulty of securing a continuous and perfect joint between the base and periphery of the root.

(3) Absence of the preventative means against the disintegration of the cementing medium, penetration of saliva and destruction of the root by caries or fracture.

Indications.

(1) As a temporary crown, (2) Expediency, (3) The instability of the root (old age, pathological conditions, etc).

Even in such instances their application should usually be confined to the six anterior teeth, because of the increased difficulty in adjusting them to the irregular shapes and uncertain canals of the bicuspid and molars.

As the permanency and success of such crowns depend to a great extent upon the degree of accuracy secured in the adaptation to the root, its base must be so shaped as to render the opportunities for a close adaptation most favorable.

In the preparation of roots to receive crowns with separable or

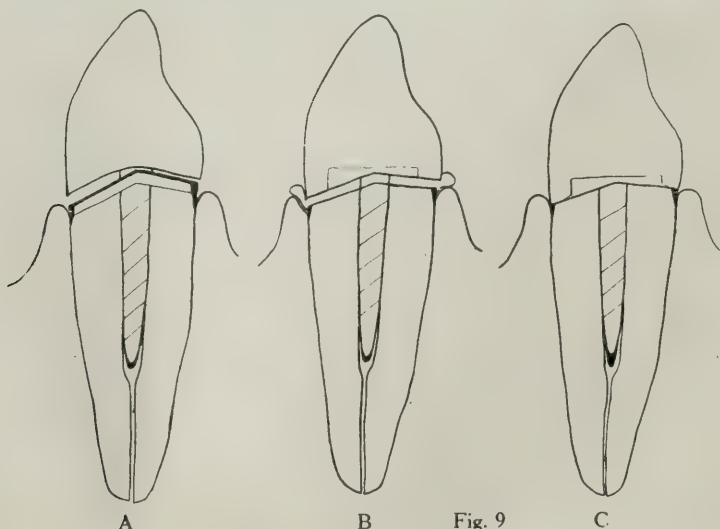


Fig. 9

inseparable dowels, the form given to the basal surface should be a double slope from the centre of the root canal.

The root is trimmed labially to a point below the gum margin, but lingually it is carried a little above or just to the gum border, leaving the root high in the centre. The reason for this double bevel is that the septum of the process comes much higher up on the root mesially and distally than it does on the buccal or lingual surfaces. This allows for a much greater bulk of porcelain, with a corresponding increase in the strength of the crown and eliminates the possibility of rotation.

After selecting a suitable crown and dowel, the root canal is enlarged. The basal end of the root is left a few mm. in excess or longer. The crown and dowel are placed in position upon the root, and careful notice taken of the points of contact between the root and crown. With square-edged stones of suitable size, kept wet, while using, with glycerine and carborundum powder, grind down the root until the gum line is reached, then the Ottolengui root faces are very useful. They are made in different sizes to correspond with the different teeth. They will do the work perfectly with but little or no mutilation of the soft tissues. They should be of the safe-sided variety, and used with care, as they cut rapidly. At the same time grind the basal end of the artificial crown at the points of contact. When the crown is fitted approximately, thin carbon paper should be inserted between the two, and the root and crown ground simultaneously. Fig. 9. A

The carbon paper marks the points of contact, which are ground until a close contact and perfect joint is secured. In some cases it might be necessary to slightly bend the dowel until the adjustment of the crown to its proper relation with the root and other teeth is obtained.

The crown may be closely adapted to the root, but sometimes it overhangs on the labial, lingual or proximal surfaces. To determine this, cut a piece of sheet gutta percha approximately the size of the end of the crown, and by heating stick it to same. Heat it again and press to place upon the root, chill and remove. This produces an impression of the end of the root in the gutta percha. Using the gutta percha as a guide, grind off the crown flush with the edges or periphery of the root. Repeat the operation to verify condition. Return crown to mouth and test the union with a fine explorer. Fig. 9. B.

The gutta percha is left attached to the crown to serve as a washer between the root and crown, which is much superior to cement, as it does not disintegrate. The crown and dowel may now be permanently mounted. Fig. 9. C.

The separable dowel crown, such as Davis', may be employed to good advantage by combining with it a gold base. It is a means of

saving time and securing accuracy in the adaptation and permanency in their attachment to the root.

A piece of pure gold plate, 34-gauge, is adapted to the end of the root, the dowel is fitted and forced through the gold and soldered, thus forming a plate, coping and dowel (which will be taken up more fully under another heading). After the plate and dowel have been properly adapted to the root, an impression and bite, and then a model is secured.

The porcelain crown is now selected and ground to fit the coping on the model instead of in the mouth. Fig. 10

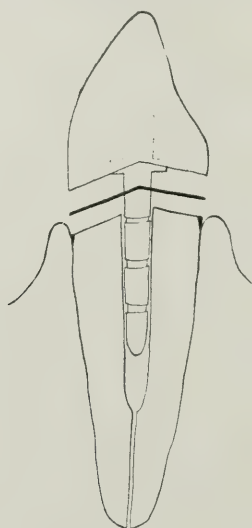


Fig. 10

Advantages.

- (1) Saving of time at the chair.
- (2) Accuracy of adaptation between both root and crown.
- (3) Adapting of the crown may be done in the laboratory.

FULL BAND OR RICHMOND CROWN.

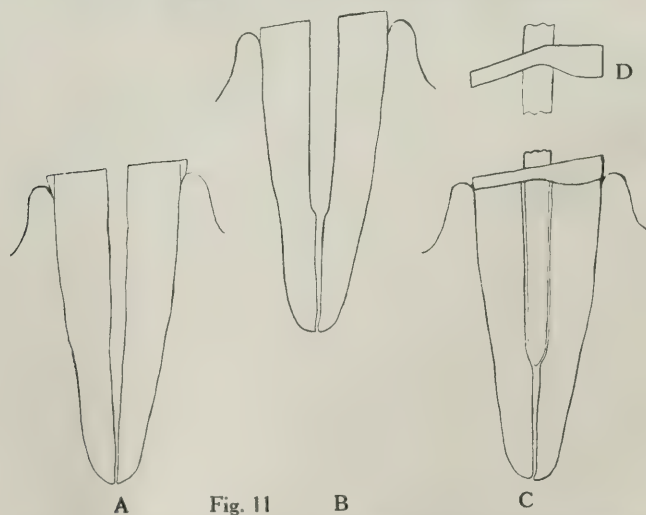


Fig. 11

Owing to the extended use of removable bridgework, the roots are not subjected to the same stress, as when the long spans of fixed bridges were used, and increased mechanical resistance to the

stress imposed upon the bridge, was necessary. The application of the full band is indicated principally in restoring weak roots of the bicuspid and molars, but rarely anterior to them, unless the root is fractured. In cases of very short occlusion, where the opposing teeth, when occluded, afford but little room for sufficient strength for any other style of crown, on roots so disintegrated and weakened as to require increased mechanical support to prevent fracture.

The full band is contra-indicated on roots anterior to the bicuspid (except on fractured roots), especially in the mouths of women, as there are more favorable and asthetic methods available.

The band should never pass under the free margin of the gum any further than is absolutely necessary, and then only far enough to protect the seam of union, which should be in such close proximity to the root as to preserve its continuity and make a smooth line of junction between the two. To do this properly the contour of the root must be entirely removed, otherwise the band will stand away from the root, cut into the tissues and set up gingival irritation.

The ledge of enamel upon the projecting end of the root must be removed in order to bring the greater diameter beneath the free gum margin. The maximum diameter of the root is at the point of junction of the enamel with the root, and this diameter generally continues about the same for about one mm. below the enamel before the root begins to taper. The removal of this enamel can be best accomplished by the use of enamel cleavers, scalers, and chisels designed for the purpose (Dr. Case and Dr. Johnson).

PERIPHERAL TRIMMING.

The instruments should have large handles, in order that the operator may hold them with a firm grip, and have perfect control of same. For the majority of teeth the instrument is grasped in the palm of the hand (like a penknife). The thumb is placed against an adjoining tooth, the instrument is passed down below the gum line, crowding the gum away from the root, until it goes beyond the enamel, which is stripped off by an opening and closing movement of the hand. All enamel being removed, the periphery of the root is made smooth with small cone-shaped stones.

The basal end of the root has been purposely left projecting out of the gum for about 3 mm. on the lingual and 2 mm. on the buccal. This serves as a guide for the instrument in trimming off the enamel; greater ease for the operator when fitting and contouring the band and taking of the measurement. It also prevents the gum from crowding down over the face of the root. All is done with little or no discomfort to the patient. Fig. 11. A.

The band is constructed of 22k plate, 30-gauge, and the joint either sweated together or soldered with 22k solder. It is conformed to general shape of the root, with the seam to the lingual. It is then carefully trimmed with curved-pointed shears (No 103), evenly

with the contour of the gum. The cervical edge is beveled or tapered at the expense of the outer surface, with No. 2 cut file and disks.

The band is now placed upon the root and gently pressed to place with a flat piece of hardwood, size 5x10x75 mm., until the edge passes just beneath the free margin of the gum. The basal end of the band is also trimmed flush with the end of the root. Remove band, and solder a pure gold cap of 34-gauge to the basal end.

The root is faced off, cutting to a point 1 mm. above the gum line on the labial, and 2 mm. on the lingual, if the bite will permit so as to give strength and additional mechanical support to the crown. A point to remember is that, in no instance, should this final preparation be made on the root until the band has been fitted. Fig. 11, B.

The shape given to the basal end of the root is either a gradual incline from the buccal to lingual or a V-shaped preparation. The buccal slope extending from the gum-line to a point lingual to the root canal. Then the lingual half is perfectly flat, meeting the lingual surface of the root practically at a right angle to the long axis of the root. Fig. 11, C and D.

The cap is placed upon the root and pressed to place. If it does not go to place, remove and examine the root for small ridges of enamel or dentine on lingual or buccal surfaces. These will prevent it from going to place.

The band part of the cap is trimmed on the buccal to a depth of 2 mm. and 3 mm. on the lingual. Next extend it under the gum margin more than is absolutely necessary, as great depth is not essential, as the greatest strength of the band is at the point nearest the floor of the cap. Fig. 11, C.

The canal being prepared, and the dowel fitted as previously described, the floor of the cap is perforated with sharp-pointed instrument, then the dowel forced to place. Take a small piece of soft compound between the thumb and first finger and secure a small impression of the dowel and cap, chill, remove and trim off the excess compound on the basal end. Then remove dowel and cap and place into the impression, thereby retaining the proper relation of the two. By taking hold of the compound, press the dowel into a charcoal block until the band of the cap is slightly imbedded, also remove compound, and solder the dowel to the cap. Replace the Richmond cap and dowel upon the root, take impression and bite, secure model and complete the construction of the crown, using facings or crowns.

In a case with very close occlusion and a weak root, where it is desirous to employ a porcelain crown, a band is fitted in exact accordance with the principle previously outlined, except that it is made twice as wide in order that one half of the width will pass upon the root and the other upon the crown. Fig. 12

The crown is selected (Ash tube), and ground to close conformation with the basal surface of the root, as well as its peripheral line.



Fig. 12

and also occlusion; the dowel is temporarily adjusted to root and crown until the crown assumes its proper relation with band in place upon the root. A piece of 34-gauge pure gold is perforated for the dowel, placed on the crown and trimmed to follow its basal outline.

With the band in place force the dowel, gold plate and crown into place by pressing with the thumb, then have the patient close the teeth tightly together, thus forcing all up into proper position. Remove the porcelain crown, leaving the band, dowel in place, with the gold base inserted half way up in the band, thus forming a band around the root end, and also around the crown end. Take compound impression with thumb and finger as previously described, remove parts and place in same, stick with wax and fill with investment material in order to sustain their relation while soldering the gold coping to the band, and the dowel to the coping.

The cap is polished, placed upon the root; the crown is placed in position, and if too long the basal edges are ground to allow for the solder, then all are subsequently mounted with cement.

THE HALF BAND CROWN.

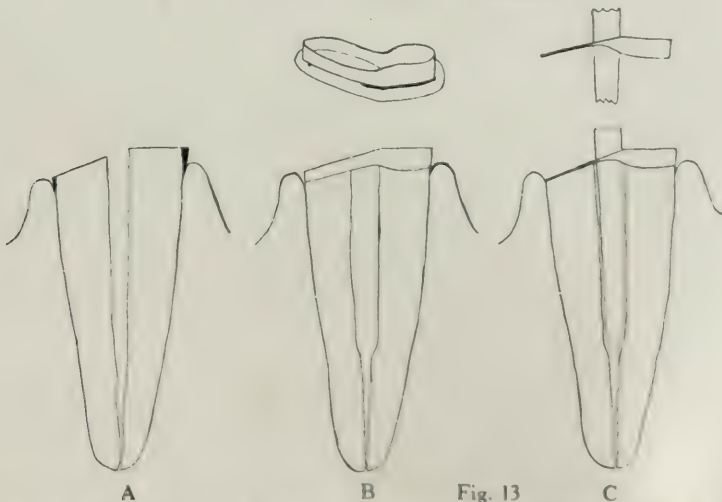


Fig. 13

The half or partial band encircles only the approximal and lingual sides of the root. It is employed to increase the stability of the attachment of the crown to the root, serves to fortify the crown against

stress in the direction in which it is usually imposed, also renders this portion of the joint between crown and root more or less immune to caries.

It is especially indicated where it is possible to allow the root to project slightly beyond the gum line on the lingual surface. It recommends itself as a useful practice on any root (except fractured), for single crowns, and is especially indicated as abutments for bridges or special attachments.

The shape given to the basal surface of the root, is the gradual incline from labial to lingual or the V-shaped preparation, the latter being preferred. The enamel should also be removed from the lingual surface only, as heretofore described for the full band preparation.

There are two methods of constructing the cap or coping. A full band is constructed and fitted to the end of the root (as described before). The floor is adapted to the band, and attached with solder on the lingual and proximal surfaces only, thus leaving the labial half free from solder. The cap is now fitted and the dowel inserted, all removed and the dowel soldered to the cap (compound impression and charcoal block). The labial half of the band is trimmed off with curved shears, the cap is replaced upon the root, and the gold floor burnished and trimmed to close proximity to the labial surface. Fig. 13, A, B and C.

A half band may also be obtained with the greatest degree of facility by adapting a piece of pure gold plate, 34-gauge, to the basal end of the root, and allowing a sufficient surplus (2 and 4 mm.) to extend beyond the root on the proximal and lingual surfaces, until the adaptation of the base has been secured, and the dowel inserted and soldered. Fig. 14, A.

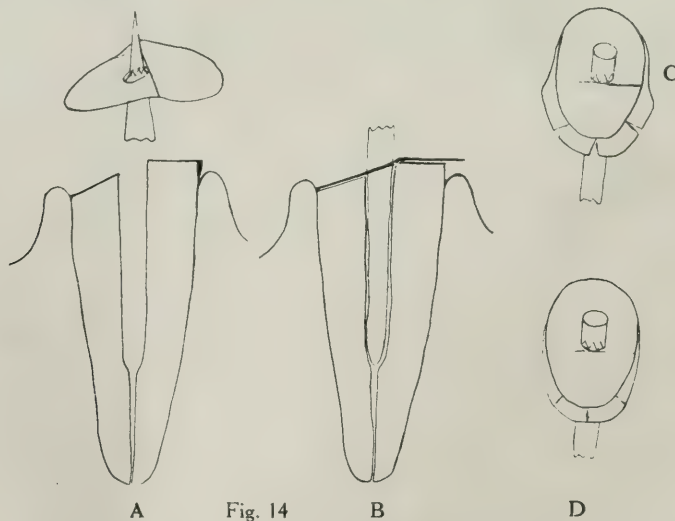


Fig. 14

Before inserting the dowel remove the coping and perforate with a sharp-pointed instrument from the under side, or root side. The instrument is forced through far enough to produce a hole about half

the size of the dowel. Place the coping in position and force the dowel through the perforation until well into position. The dowel will tend to carry the metal up into the canal, and by so doing the metal will bind around sufficiently to sustain their relation while removing and soldering. Fig. 14, A.

The dowel and coping are adjusted to position on the root, where it is held firmly by pressing on the dowel. With an automatic plugger and smooth boot end, or piece of orangewood in same, mallet the coping close to the end of the root; remove coping and trim off the surplus gold on the labial side close to the peripheral line, which is indicated on the gold from malleting. Replace and with heavy plastic instruments burnish the surplus gold close to the lingual and proximal sides of the root. Trim to follow curvature of the gum. It will be found that the surplus gold on the lingual has lapped over or buckled; cut a slight incision through this point, at the same time cutting a little to excess, so as to produce a triangular-shaped space. More than one incision may be indicated, and are permissible when necessary. Draw this V-shaped space together and solder with a very small piece of solder. Adjust to root and finish, burnishing to place. Fig. 14, B C and D.

(To be continued in next issue.)

Multum in Parvo

STERILIZING IMPRESSION WAX.—Dentists used to use impression compound more than once and perhaps a few do yet. To those dentists: Keep a large jar such as a glass battery jar two-thirds filled with strong formaldehyde solution flavored with oil of winter-green. Wash your compound impression and place in this jar until ready to pour. After removing the plaster model, place the cleaned compound again in the jar and leave until needed again. We do not claim that all the wax is sterile, but is as near as perhaps any other method. There are other articles in dental practice that will not bear boiling, but may be placed for a time in this jar. Keep a glass slab over the jar.

TO USE OLD WAX AGAIN AND MAKE USEFUL.—Place all your old wax in a large, deep pan of water and boil. While wax is still hot, fill a medium size glass bottle with cool water and cork bottle and tie string around neck of bottle so you can handle it. Then use soap and water outside of bottle, washing off excess of soap and water. By doing this wax will not stick. After this is done drop your bottle down in the hot wax, drawing it away once or twice or as many times as desired. When bottle is drawn out of wax, let it cool for a few minutes, strip off the wax from bottle and cut into sheets as desired. You then have wax ready for use.—*Elkan W. Fishell (Dental Review).*

THE COMPENDIUM

This Department is Edited by
THOMAS COWLING, D.D.S., Toronto

A SYNOPSIS OF CURRENT LITERATURE RELATING
TO THE SCIENCE AND PRACTICE OF DENTISTRY

THE GENERAL PRACTITIONER AND HIS RELATION TO ORTHODONTIA.

ONE of the questions in dentistry around which verbal warfare has waged fast and furious is whether a general practitioner ought to attempt the treatment of malocclusions or whether this work is best left in the care of those who have made a special study of this particular department of dentistry. Like a good many other contentious subjects it remains unsettled. The need for orthodontia, however, grows more apparent every day. What can be done to relieve the situation? If this department of dentistry belongs exclusively to men who are educated particularly for it, then it is to be hoped that their number will soon be increased. There is great doubt in the minds of many as to the advisability of general practitioners endeavoring to "do their bit" because it has been shown the majority of cases so treated have proven failures, not because of lack of interest, but solely because of want of skill. This is an unfortunate situation, because it has a tendency to discredit the work of fully qualified orthodontists.

It is just possible that some general practitioners are able to correct simple cases of malocclusion such as those involving one or more teeth in the anterior region, with satisfaction, but in the majority of cases failure will be inevitable when he attempts the more complicated cases, such as those involving the posterior teeth. No one is in a better position to see the poor results of our attempts along this line, than is the skilled orthodontist, for it is he who is called upon to correct our failures. Orthodontic specialists have some very decided views about this, and it will do us good to become acquainted with them. It is then with keen interest that we take up Dr. E. G. Weeks' paper, published in the September "International Journal of Orthodontia." The author, in the opening paragraph of his essay, confesses that he does not approve of our undertaking difficult cases. "My reasons for coming to this conclusion," says Dr. Weeks, "are

many. In the first place, the average general practitioner knows nothing about the normal occlusion of teeth from the standpoint of forces of occlusion as being the factors in the production of normal occlusion. The average practitioner of dentistry knows little in regard to muscular stress relative to the eruption of the teeth, the effect of atmospheric pressure in the development of the mandible and the maxilla, the importance played by the inclined plane and the proximal contact points, and the intimate relation of harmony in the size of the arches as regards the correction of normal occlusion. If the general practitioner is ignorant of these things, which are fundamental basic principles in the correction of mal-occlusion, how can one expect him to obtain results in the correction of mal-occlusion that will reach any degree of efficiency."

In an effort to make amends for his lack of knowledge of orthodontia, the general practitioner resorts to many and devious methods of instruction. Chief among these is the correspondence school. All over the country there have sprung up dental laboratories to which may be mailed models of work to be done and from which there are sent crowns, dentures and orthodontia appliances,—all the products of skilled mechanics who do excellent work, but who labor at a great disadvantage in that they have only a model to guide them and do not see the patients for whom the appliances are designed. It is inconceivable that the best results will be obtained under any such system. In order to remedy this defect, these enterprising manufacturers have gone still further, and they now undertake to instruct the practitioner by mail, as the case progresses. This system looks ideal at first sight, but we all know how difficult it is to carry on any case, particularly if it presents unusual difficulties, by any correspondence method. Dr. Weeks discusses in particular a new phase of the correspondence school which is receiving more than the usual amount of notoriety at the present time—"Orthodontic Engineering." This is his opinion: "Concerning the correction of teeth by the correspondence system, we find advertised in the dental journals at the present time, or at least in one journal, a very elaborate method under the term 'Orthodontic Engineering,' whereby charts are made of certain cases, appliances are designed, and the maps of malocclusion and charts are sent to the general practitioner, with the information that by following these orthodontic charts, he will be able to accomplish as satisfactory results as are accomplished by men who have been engaged in the practice of orthodontia for years. Admitting that competent orthodontic engineering has a certain future and place in orthodontia, I do not believe it is possible by making a few maps of malocclusions to instruct the general practitioner so thoroughly that he can treat malocclusions satisfactorily, unless he has had other training along orthodontic lines." That one may have especial skill in

designing appliances is readily conceded by the author, but he questions the ability of anyone to design an appliance for teeth he has never seen and suggest what development is necessary in the facial growths of patients he has never seen.

Granting that the case has been properly diagnosed and that suitable appliances have been devised for that case, it is very likely that the general practitioner may be deficient in manipulative skill and not get the desired results. Here is the reason, thinks Dr. Weeks for many failures in orthodontia. "The average practitioner knows very little about malocclusion. * * * If you ask him anything about the principles of appliances, certain kinds of anchorage or retentions, it would be like talking a foreign language to him. * * * The general practitioner may be a very clever workmen in certain dental lines, but that does not necessarily insure that he is capable of correcting the different types of malocclusion. In fact, sometimes the simplest types of malocclusion cause the most serious results because what appears to be a simple type is really a complicated condition."

In support of his contention that orthodontia is best left to the specialist, Dr. Weeks quotes numerous cases to show the ill-effects following treatment of difficult cases by incompetent dentists. In some cases, he says, that thyroid glands have had to be removed on account of infection, this being due to the unskilful movement of the teeth by dentists. One case in particular is cited to show how a hurried orthodontic operation resulted disastrously: "I know of two young ladies, aged, respectively, eighteen and twenty-one, who had bad cases of malocclusion and the dentist put the anterior teeth in each case in a somewhat acceptable shape in three months' time. Afterwards radiographs proved pyorrhea or something else had absorbed the process of all the anterior teeth. In each case another dentist extracted eight teeth for the young ladies." Such unfortunate conditions, thinks Dr. Weeks, receive unfavorable comment among people, and the impression becomes current that all orthodontia leads to the loosening or final loss of the teeth.

Having established a case against the general practitioner and his incomplete orthodontic efforts, the author sums up his position in these words: "It has been my experience that the general practitioner who knows the most about orthodontia is the man who attempts to treat the fewest cases. * * * I believe that the best thing the orthodontists can do for his own salvation is to properly educate the dental profession along orthodontic lines until they realize the importance of the work and realize that 'a little knowledge is a dangerous thing,' and unless the case is properly handled, a large amount of unsatisfactory results will occur, which not only has a bad effect on the general practitioner himself, but on orthodontia and dentistry as a whole."

DENTAL HYGIENISTS.

THE Dental Hygienist Movement, inaugurated with so much promise, has, one is bound to admit, lost a large measure of its eclat. To prove that the age of chivalry is not yet dead, we ordinary male members of the dental profession are free to admit that the failure, if such it may be termed, of the fair feminine hygienists is not chargeable to them or to their efforts, but is due entirely to mere man's mistake. Too much was expected; indeed a close scrutiny of the requirements demanded of these young ladies exposes a condition that is difficult to understand.

But to begin at the beginning! The movement to establish the order of "Hygienists" was unfortunate even as to the choice of a name. Why "hygienist?" Such a term ordinarily implies that the possessor of it has spent many years in study and application. Dental hygienists, so-called, can hardly lay claim to this designation on the grounds of training. However, there is not much importance to be attached to the name, except that there is a danger of the public confusing the term and considering the dental nurse as being equally qualified with the medical nurse. This would be very unfortunate. The medical nurse spends years in laborious training and would rightly resent being placed on equal terms with a dental nurse, who only spends a fraction of that time.

In referring to this aspect of the subject, the editor of "The International Journal of Orthodontia" gives a report of the time spent at one institution by those who aspire to become dental hygienists: "The lectures were held in the evenings on Mondays, Wednesdays and Fridays, and with the exception of vacation at Christmas time, ran from November 17 until March 30, a period of slightly over four months, in which these "dental hygienists" received lectures in the evenings, three days a week.

The Forsyth Dental Infirmary for Children, Boston, is an institution known to every practitioner in Canada. This institution is undertaking to train dental hygienists, and this is their programme. Candidates for training must be eighteen years of age and must have a high school education. In twelve months she will have been graduated as a qualified "dental hygienist," having "covered" the following subjects: Orthodontia, histology, anatomy, physiology, bacteriology, oral bacteriology, laryngology, roentgenology, investing tissues of the mouth; contagious, infectious and communicable diseases, general and oral hygiene, instrument and technic work, operative technic, clinical dentistry, clinical prophylaxis, oral pathology, sterilization and asepsis, dental pathology, teaching oral hygiene to children, oral surgery, extraction, novocaine anesthesia, dental jurisprudence, therapeutics, prosthetic prophylaxis, dental materia medica, general organic chemistry, orthopedics and neurology.

Is it fair to ask any eighteen-year-old girl or anyone else, for that matter, to "cover" all these subjects in twelve months, and in addition to do clinical work each day from 9 a.m. until 5 p.m.? Is it fair to the profession to make an announcement of this kind that will reach the public and so hold up dentistry to ridicule? This course of study, to be covered in twelve months by a young girl, is just as comprehensive as that required of a robust "freshman" in four years, and it keeps him hustling to do it! Would it not be more feasible to have these young ladies take the complete dental course of four years and graduate as dentists, especially trained in "oral hygiene"? Assuredly such a course would be more attractive to them and at the same time more helpful to the profession.

Lieut.-Colonel Gow Joins the Benedicts



AN interesting military wedding took place very quietly, a few weeks ago, in the Anglican Church, Basinstoke, England, when Nursing Sister L. Margaret Stevenson, eldest daughter of Mr. and Mrs. David Stevenson, Toronto, became the bride of Lt.-Col. George Gow, of the University of Toronto Base Hospital, Overseas.

Both bride and groom went overseas with the University Hospital, and have served over two and a half years at Salonika and in England.

While at Salonika Lt.-Colonel Gow was decorated with "The Order of the White Eagle," by King Peter, of Serbia, in recognition of dental service rendered the King. Lt.-Colonel Gow has been mentioned in despatches upon different occasions, because of the splendid service he has rendered in connection with the dental work of No. 4 Base Hospital.

Lt.-Colonel Gow, because of his unassuming and genial manner, and his skill as a dental surgeon, is most favorably known in dental circles, and his many friends extend to him their very best wishes and heartiest congratulations.

MULTUM IN PARVO

This Department is Edited by
C. A. KENNEDY, D.D.S., 2 College Street, Toronto

HELPFUL PRACTICAL SUGGESTIONS FOR PUBLICATION, SENT IN BY MEMBERS OF THE PROFESSION, WILL BE APPRECIATED BY THIS DEPARTMENT

TO PREVENT NON-INTERFERENCE WITH THE NATURAL MOVEMENT OF THE TEETH.—In artificial appliances, use carbon paper between the teeth in the mouth. Instruct patient to give a “chewing motion.” Remove appliance, and “stone down” the marked areas. By repeating exercise no undue stress will be placed on any part, either artificial or natural.—*W. E. Cummer, D.D.S., Per I. H. Ante.*

TO PREVENT GAGGING DURING IMPRESSION TAKING.—To take an upper plaster impression without gagging the patient, have your mouth mirror at hand, and just as you press the tray of soft plaster to roof of mouth place mirror directly back of tray in the palate. As you press the plaster up the excess flows back against the mirror. Pull it forward and back, thus avoiding a mess of plaster on the soft palate. This avoids possible choking.—*W. C. Shallenberger, Chicago (Dental Review).*

DIETETIC TREATMENT OF CHILDREN IN RICKETS.—If a breast-fed child presents any of the symptoms of rachitis, the milk of the mother should at once be sent to a laboratory of clinical pathology and be examined for its quantitative and qualitative properties, and if it is found to be deficient in any one of the normal properties which mother's milk contains, the breast milk should be withdrawn and so modified that the deficiency is added; or, if possible, a wet nurse should be employed. If, on the other hand, it is found that the conditions are such that one cannot correct the error in the milk, and a wet nurse is not to be had, the next step is to employ modified cow's milk. In addition to cow's milk, the child should receive barley water, oatmeal water, and later a small amount of fruit juices. If the child is not suckling, it should be given rice, cream of wheat, farina, and fresh vegetables which are thoroughly cooked. Vegetables not to be given are cabbage and turnips, for those two vegetables are very hard to digest, as they are rich in sulphides. The juices of fresh fruits are also very good, as is good cream and butter. If the child is old enough to digest the proteids, it should be given good fresh country eggs, fish, chicken and small amounts of rare beef.—*International Journal of Orthodontia.*

PRO BONO PUBLICO

This Department is edited by FRED J. CONBOY, D.D.S., and will contain dental information in a form suitable for publication in the public press.

Members of the profession are urged to arrange, from time to time, for the insertion in a local paper, of the material appearing upon this page.

The Menace of Unsanitary Mouth Conditions

STATISTICS show that from 88 to 98 per cent. of children have decayed teeth. Dental caries, (or decay of the teeth), is the most common of all diseases—so common that it has been taken as a matter of course and the people believed it must always be present. This is not true and has undoubtedly handicapped the race. The famous Dr. Osler says:—"If I were asked to say whether more physical deterioration was produced by alcohol or defective teeth I would unhesitatingly say, 'Defective teeth.'" Now, this condition of diseased teeth exists throughout the civilized world; and why has it existed this way so long? There is only one answer,—Ignorance. The civilized people remove accumulation of waste and foreign debris from other portions of the body, but seem to neglect the most important part—their mouth.

It is important that we should have oral hygiene in our schools. It means the safety of all those whose mouths are neglected and those whose mouths are kept clean, for the simple reason that the children cannot be kept apart.

The oral cavity may be the dirtiest, filthiest cavity in the body, and it contains bacteria of almost every form. These are mixed with the food and swallowed into the stomach, or blown out into the air, or deposited upon the end of lead pencils for the normal children to absorb,—then infection is easy.

Thousands of cases are known of children between the ages of 8 and 12, who, while constantly under the care of the family physician, remained in a most unsatisfactory condition of health until taken to the dentist, and their teeth properly treated, with the result of an immediate improvement in health, growth and development, physical and mental. More diseases of children are daily being traced directly to unsanitary conditions of the teeth. An eminent Chicago physician does not hesitate to express the opinion that, at no distant date, most of the diseases that carry off our children or leave them to a life of suffering and under-development, will be known to have their origin in the mouth and teeth,—conditions that a very little care at the proper time will make impossible.

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TORONTO, DECEMBER, 1917

No. 12

EDITORIAL

1917---Season's Greetings---1918

ORAL HEALTH, both in its own behalf and that of the Dental Profession, offers sincere good wishes to all our boys in khaki. The dentists in civil practice send cordial Christmas greetings to the Canadian soldiers, including the members of the Canadian Army Dental Corps. God bless you all and may the coming year be to each of you one of joy through the consciousness of loyal service, well and faithfully rendered.

Oral Hygiene in the Rural Schools

ARE the boys and girls in the rural schools of the Dominion getting a square deal to-day in the matter of proper instruction in the care of their teeth? The Oral Hygiene Committee of Ontario does not think so and is, therefore, bringing strong influence to bear on the Provincial Government to remedy this weakness in the school system of Ontario.

At the present moment the matter of medical and dental inspection in our schools is in a somewhat unsettled condition as far as

jurisdiction is concerned. Until recently the whole system was under the control of the Education Department at Queen's Park; however, at the last Municipal election in Toronto the city voted, by a large majority, to have it transferred to the Department of Public Health. The Government acquiesced and made the change as far as Toronto is concerned, but postponed similar action in the other parts of the Province until the wishes of the people were ascertained.

Recently, however, there has been a strong feeling throughout the Province, as manifested in the Women's Institute and Public School Teachers' Conventions, that some immediate and adequate legislation should be presented, providing the necessary machinery to introduce dental inspection and oral hygiene instruction in the schools throughout the whole of Ontario.

With that end in view and in an effort to further educate public opinion the Oral Hygiene Committee has been sending its members and others of the profession, to address many of the public school teachers' conventions in different parts of the Province. The reports coming back from these conventions show that the teachers and other educational leaders are strongly of the opinion that there is urgent need for such a forward step, particularly in the rural districts.

The matter was brought definitely before the Prime Minister and other members of the Ontario Cabinet during the recent conference of the Ontario Oral Hygiene Committee in Toronto. The deputation, which was made up of representative dentists, educational leaders and members of the Women's Institute from different parts of the Province, urged upon the Cabinet the importance and reasonableness of the special legislation proposed by the deputation.

The proposed plan will favor a comparatively inexpensive beginning. A chief dental inspector for the Province will be appointed with headquarters at the Parliament Buildings. He will have for his staff, immediately or in the near future, say two travelling inspectors. The township is to be made the inspectorial unit. The duties of the Chief Dental Officer will be that of organization, including the education of the people by means of literature and addresses to the Women's Institute, Teachers' Conventions, and other public bodies.

Legislation will be provided so that any township or other unit may introduce dental inspection into the schools of that particular community, and invite one of the dental inspectors to carry out such inspection. The Government will pay all salaries, office expenses, literature, etc., leaving only the travelling expenses of the dental inspectors to be paid by the township.

The whole movement will be planned so as to secure the co-operation of the school, the home, the Women's Institute, and the dentist.

The dental inspector will visit each school in the township, examine the teeth of the children, and make out a report on each case which

will be sent to the parents. Afterward there will be a plain and impressive talk given to the children on how to properly care for their teeth. Whenever possible, also, a public meeting will be held, in the school building that evening, at which the dental inspector will give a lecture, illustrated wherever possible, on the importance and care of the teeth.

Such a plan, although begun on a comparatively small scale, will, we believe, under wise and energetic management, undoubtedly develop into one that will soon cover the whole Province. R. J. M.

Private I. C. Mallough Killed in Action

WORD has reached Toronto of the death in France of Private I. C. Mallough, a Second Year student in the Royal College of Dental Surgeons of Ontario. Mr. Mallough enlisted as a private in the C. A. M. C., and went overseas in January last. Upon arrival in France he was transferred to a Field Ambulance Corps and has been rendering heroic services upon the fields of Flanders.

Sergeant L. S. Smith Dies in England

REPORTS have reached Oral Health that, Sergeant L. S. Smith, who graduated from the Royal College of Dental Surgeons in the spring of 1916, died at the Lord Derby War Hospital, Warrington, England, on the 26th November, 1917. Sgt. Smith enlisted in the C.A.D.C. in October, 1916, and subsequently transferred to the Canadian Command Depot at Hastings, and later at Seaford, being engaged in Base Hospital Work.

Dr. Cowan to Contest Regina as Unionist Candidate

MAYOR W. D. COWAN has been selected by the City of Regina to carry the Unionist Standard at the approaching Dominion elections. Dr. Cowan's long association with the City of Regina and the West fits him admirably for public service in the National interest. We are only sorry not to be able to get in the fight and give the candidate a hand.

Here's hoping Mayor Cowan wins, and judging by his past performances, we are sure he will.

Congratulations

MAJORS W. G. THOMPSON, Toronto, and J. M. Wilson, Kingston, have been gazetted as Lieutenant-Colonels. Congratulations!

Oral Health Policy for 1918

It will cost more money to produce Oral Health during the coming year than at any time during our seven years of publication---provided of course, we maintain present quality of paper and high standard of printers' art.

FOUR COURSES OPEN

We have carefully considered which of the following plans we ought to pursue :

- First---To reduce the cost of production by cheapening the product ;
- or, Second---To increase subscription price to the dentist ;
- or, Third---To raise the advertising rates ;
- or, Fourth---To carry on "business as usual."

OUR DECISION

The present conditions being unusual and of a temporary nature, we have rejected the first three and adopted the fourth plan of action, and feel confident of your valued and loyal support in our determination to "carry on." Our subscription price will remain as heretofore and this decision will, doubtless, mean a much larger circle of readers during the coming year.

OUR POLICY FOR 1918

We propose to produce an improved journal for the dentist and to continue sending Oral Health each month, to members of the dental profession in the Canadian Expeditionary Force. We need the very best support you can give us during 1918 and urge upon our readers the desirability of prompt renewal that the January issue may go forward to subscribers without delay.

Send \$1.00 direct to Oral Health, or, if you prefer, order through your Dental Dealer.

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DENTAL SUPPLIES

Gold & Silver Refiners, Sweep Smelters & Assayers

71 LOMBARD STREET - TORONTO, ONT.

Manufacturers of "SUCCESS" Alloy

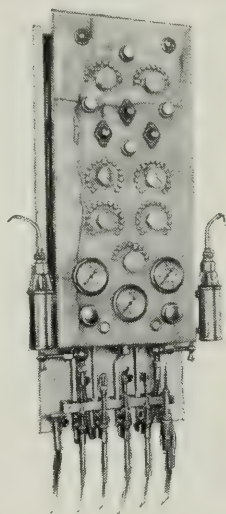
"SUCCESS" GOLD

Price List—September 1st, 1917.

	Per Dwt.	Per oz.			Per Dwt.	Per oz.
Pure Backing	\$1.15	\$23.00	No. 22 Solder		\$1.00	\$20.00
Ingots	1.15	23.00	No. 20 " .....		.95	19.00
22 K. Plate or Crown Gold	1.05	21.00	No. 18 " .....		.85	17.00
20 K. Plate .....	.97	19.40	No. 16 " .....		.75	15.00
18 K. Plate .....	.89	17.80	No. 14 " .....		.65	13.00
18 K. Plate Backing .....	.90	18.00	No. 20 Solder Special .....		.95	19.00
			No. 18 " .....		.85	17.00
			No. 16 " .....		.75	15.00
	Per Dwt.	Per oz.			Per Dwt.	Per oz.
Gold Shells	\$1.08	\$21.60	Clasp Plate		\$0.90	\$18.00
Gold Discs	1.07	21.40	Clasp wire (1/2 Rd. or oval)		1.15	23.00
Gold Cylinders ... 1-10 oz.	3.00	30.00				
Gold Ropes .....1-10 oz.	3.00	30.00				

Iridio Platinum Posting, Round or Square, price varies
English Dental Alloy Posting (33 1-3 p.c. Platinum), price varies
Gold and Platinum Posting, Round or Square, price varies

We will pay CASH or give VALUE in any of THE ABOVE in return for Sweeps and Scrap

ELECTRO MFG. CO. DENTAL

A Switchboard With **66** Uses

SIXTH INSTANCE—THE ROOT CANAL DRIER HAS FIVE USES—AS FOLLOWS:

1. For drying and sterilizing canals preparatory to treating or filling.
2. Facilitates the removal of gutta percha canal fillings.
3. For promoting the action of canal dressing by heating the dressing in place.
4. Good means for applying internal heat in the treatment of periapical and peridental lesions.
5. Has three detachable and replacable silver points, fine, medium and coarse.

And every dentist who does these things mentioned above, by old-fashioned methods, will readily recognize the greater advantage of obtaining better results through the use of the Electro Dental Switch Board and set of practical instruments.

The Electro Dental Switch Board has twelve other instruments with SIXTY-ONE more uses.

Send for catalog and terms.

THE ELECTRO DENTAL MFG. CO.
PHILADELPHIA, PA.

Usable Knowledge

Intensive development of resources and opportunities results in more than ordinary success. In many cases it proves to be the difference between a truly successful dentist and one whose achievements are mediocre.

We assume that all dentists are aiming for the stars of success, either financially or in fame. Old-fashioned methods, equipment and ideas are eclipsed quickly in these days of rapid progress.

A careful reading of professional literature and advertisements will increase your power.

DENTAL ITEMS OF INTEREST prints each month such material as will increase your capacity for work and your earning power.

The articles in DENTAL ITEMS OF INTEREST are in lucid form and are profusely illustrated for practical application in your own practice. Modern methods are easy for you to adopt if you read the modern journals. Your standing can never be impeached if you do.

A series of valuable articles by a well-known specialist will appear in the 1918 volume telling you how to save teeth by Ionization, Root Amputation, Cleansing or Filling of Canals. They will describe the proper application of Ionization and what occurs in the Apical tissues under that treatment; the selection of cases for root amputation, its technic and after treatment; how to save teeth that infect the vital organs of the body and just when diseased teeth should be extracted. How to use and read the radiograph in root-canal diagnosis is part of the series.

There will be more of the valuable articles in the departments of Exodontia, Prosthodontia, Orthodontia, Radiodontia, Society Papers, Around the Table, Exclusive Contributions, Clinical Demonstrations, Dental Laws, etc.

Every phase of the science and practice of dentistry, from prophylaxis to oral surgery, from temporary fillings to bridges, will be dwelt upon to show the newest practice in each of these branches and their practical advantage over those you now use.

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Consolidated  Dental Mfg. Co.

**PUBLISHERS
130 Washington Place
NEW YORK**

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Dental
Items of Interest
For 1918**

Minutes Mean Money

THAT'S the beauty of having an "OFFICE SPECIALTY" Card Record System, Doctor. You turn those elusive waste minutes into profit—you get 60 full minutes' worth of resultful work out of every hour.

Take a case. You have a patient in the chair; probably you're kneading amalgam, waiting for the cement to harden in a crown, or getting your instruments ready. Instead of mere vacant waiting your next patient's card is on the instrument case before you. You can refresh in your memory the details of the treatment; where you left off and just what ma-

terials you need to go on with the work. So when the next patient sits in the chair you can get right down to business. This time-saving feature is only one of the big advantages of an "OFFICE SPECIALTY" Card Record System. There are many more and we'll be glad to tell you all about them if you'll just drop us a line.

Put a card in the mail to-night and get all the information on a time-saving Card Record System that was designed just for you. It'll be a profitable move to you, we know.

OFFICE SPECIALTY MFG. CO. LIMITED

Largest Makers of Filing Devices and Office Systems in the British Empire.

Home Office and Factories: **NEWMARKET, CANADA**

9 FILING EQUIPMENT STORES:

Toronto, Montreal, Ottawa, Halifax, Hamilton, Winnipeg, Regina, Edmonton, Vancouver.

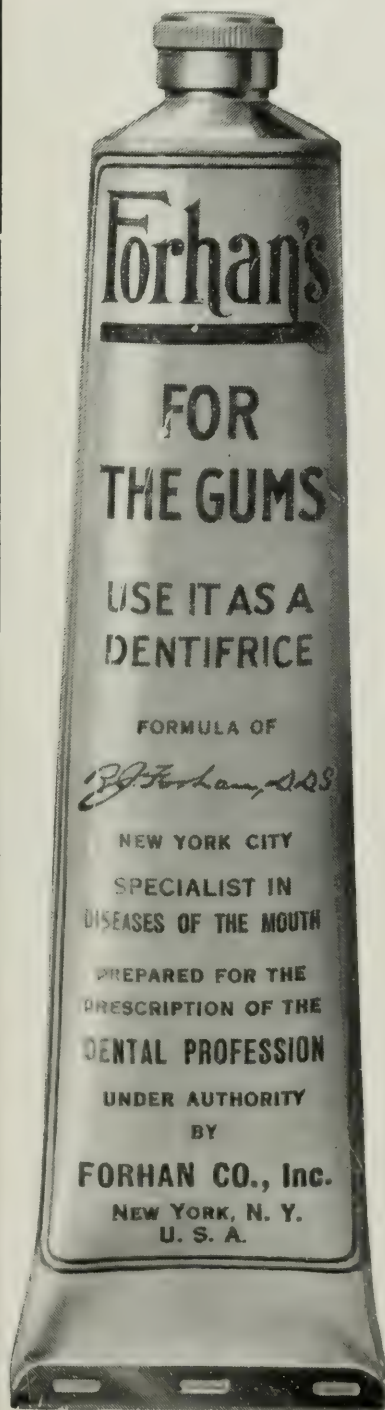
Prescribe Something More Than a Tooth Paste for a Diseased Condition

If you are treating a patient for a diseased condition, is it reasonable to have him use only a dentifrice? It falls short in convincing him of the necessity of treatment of the gums.

Let your prescription convey the idea that you have prescribed for the patient something which will do more than merely polish his teeth. Let it be of a consistency which will encourage massaging with the fingers.

A diseased condition of the mouth requires constant and consistent treatment and the profession has come to realize that Pyorrhea cases should be refused unless the full co-operation of patients can be secured.

Forhan's For The Gums (paste) may be prescribed through druggists, but the liquid—**Forhan's Astringent** is on sale through dental houses solely, and is sold **ONLY TO DENTISTS**—not to the public.

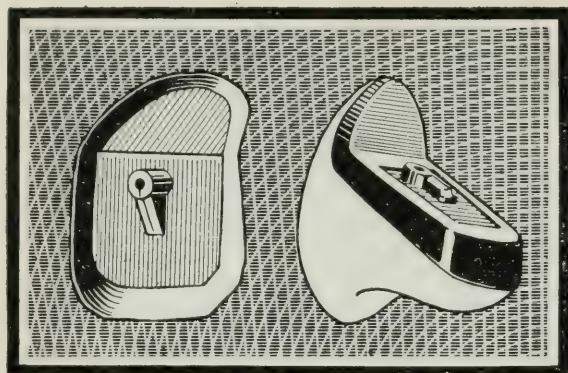


Actual Size.



Actual Size.

Forhan Company, Inc.
200 Sixth Avenue - New York



Box-in Posteriors

Q In comparison to the strength of the human jaw, Steele's Interchangeable Posteriors are without question, stronger than natural teeth, but it is the unnatural stress, brought to bear on artificial teeth, that makes it necessary to give them strong support.

○ ○

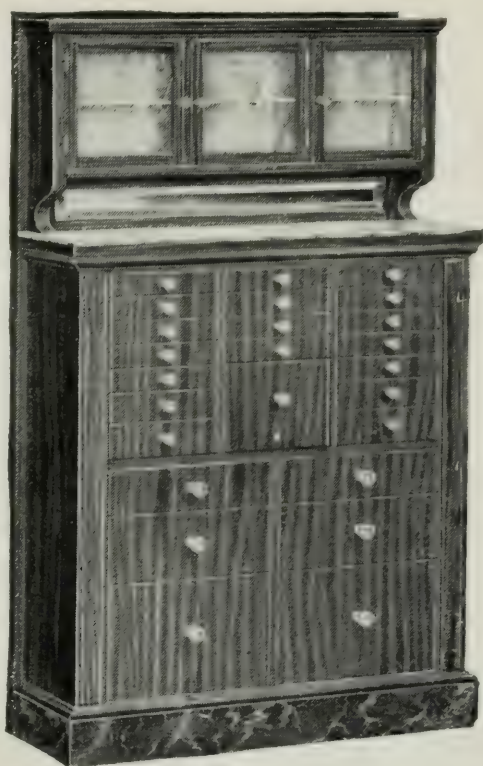
Q Breakages have been caused by insufficient support and improper cementation of the posteriors, but these causes are removed by properly boxing-in the teeth and cementing them in perfect adaptation with their backings.

○ ○

Q Send for "The Technic of Boxing-in Posteriors."

Address

*The Columbus Dental Mfg. Co.
Columbus, Ohio, U.S.A.*



No. 60 Cabinet.

You Make No Mistake

If you select either of the two Cabinets shown on this page.

Both are in hundreds of dental offices and are giving the very best of satisfaction. Why experiment?

Our new catalogue shows a very complete line of furniture, including several new designs. Shall we send it?

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The American
Cabinet Co.

Two Rivers - Wis.



No. 94 Cabinet.

A New Assortment in
Paper Disks

Fifteen hundred to the box. Grits and sizes properly balanced. The exact disk for every purpose without any detective work.

To sum up:—

Practical

Convenient

Economical

Better let's send you a box for your approval.

Sell at \$1.50

The Temple-Pattison Co., Limited

TORONTO

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See our "Red Seal" Accident and Sickness Policies Special Features offered to Dental Surgeons

Insure against
loss of income
through Accident
or Sickness

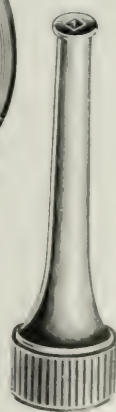
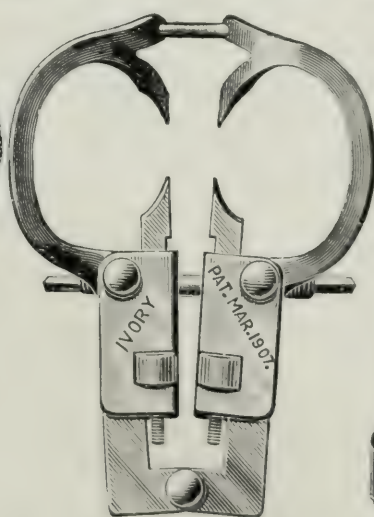
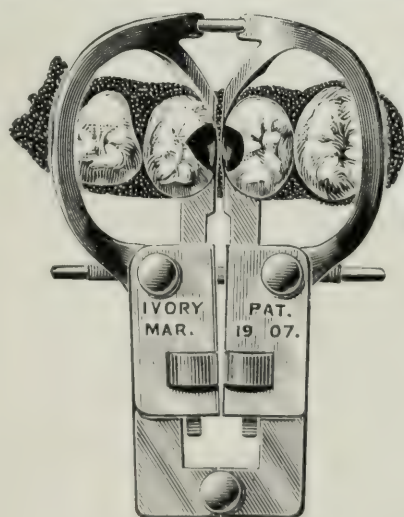


Policies cover every
sickness and are
entirely free from
vexatious restric-
tions

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BRANCHES—Quebec and Maritime Provinces..MONTREAL
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Ivory's Adjustable Separator



Price Each \$5.50

The jaws of each half of the separator working independent allows for the difference in the size of teeth, and gives a wide range for adjustment of the jaws where teeth are irregular. The jaws need never interfere or cover the margins of the cavity, and there

are four points of contact to hold the separator rigid IF the jaws are not forced too far between the teeth. The spreading force (two right hand threads) is many times slower than ordinary screw force, no binding of the screw is possible, and its action is the most powerful screw force known. It is universal for all operations extending beyond the first molars working on either side of the arch.

ALL DEALERS.

Manufactured by

J. W. IVORY, 21 North Thirteenth Street, Philadelphia, Pa.

VULCOLOX

(PATENTED)

CONSTRUCTION

In the building of Vulcolox Teeth every engineering principle, every mechanical law that was involved in the Vulcolox idea, was searchingly studied. Upon this foundation sure progress was made, resulting in the Vulcolox construction, which assures strength of tooth, security of attachment, distribution of strain, unrestricted alignment, and improved (more natural) appearance.

CONFORMATION

Vulcolox Teeth follow Nature's design. The free portion (crown) increases rapidly in its labio-lingual diameter from just beyond the cutting-edge to the linguo-gingival margin; while the supporting portion diminishes gradually from that line. There is no sharp cutting-down of the porcelain immediately beyond the gum line,—forming a line of weakness—as in the forms that preceded Vulcolox.

CONFIDENCE

Confidence in the fundamental principle of the Vulcolox retention inspired the development of Vulcolox Teeth. The internal interlocking attachment and balanced retention reinforced by the natural tooth conformation assured:

1. **A Stronger Form of Tooth**
2. **A Better Attachment**
3. **Unrestricted Liberty of Alignment**

CONVINCING

The mechanical advantages outlined above, are only a part of the greater utility afforded by the Vulcolox conformation. Vulcolox teeth can be mounted in any practical alignment desired—set inside, outside, or on the ridge, rotated as required, without exposing the vulcanite in the interstices or lessening their functioning efficiency.

FOR SALE BY DENTAL DEALERS.

S. S. WHITE COMPANY OF CANADA, LIMITED

489 College Street, Toronto

Wholesale Distributors in Canada for

THE S. S. WHITE DENTAL MFG. CO.

PHILADELPHIA, U. S. A.

S. S. White Modelling Composition



softens easily, hardens quickly, keeps indefinitely, gives clear, sharp, well defined impressions, economizes the operator's time, is always dependable.

Makes Quick, Accurate Models

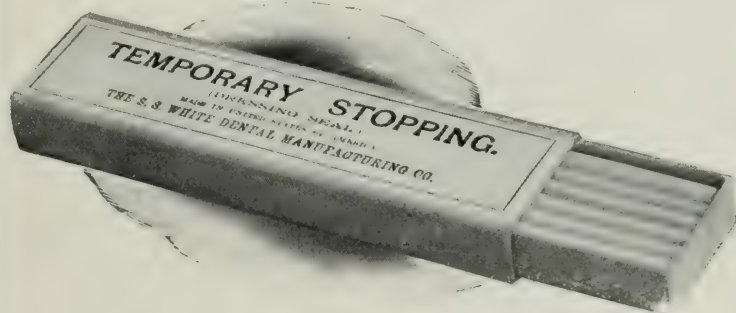
and is especially indicated in orthodontic cases; fractures of the lower jaw; or where undercuts and inclined teeth complicate impression-taking.

Sold in half-pound boxes
Per lb. \$1.25.

S. S. White Temporary Stopping

"Best by Every Test"

There's no risk of a leaky seal when using S. S. White Temporary Stopping. Once placed it "stays put" as long as required, keeps the medication in, the oral fluids out.



S. S. White Temporary Stopping softens at low heat, approximately 145 degrees F.; works smoothly with a minimum pressure and doesn't contract after setting. It is convenient to handle; non-irritating to the mucous membrane — saves the patient discomfort.

S. S. White Temporary Stopping

Meets Every Requirement

—as a medicament seal; as a permanent root-canal filling; for lining a sensitive cavity or for any other purpose where a temporary gutta-percha stopping is indicated.

Sold in round sticks of 1-8 and 3-16 in. diameter

All White, All Pink or Assorted

Per box (1 oz.) 70c.

6 boxes (any kind) \$3.60

FOR SALE BY DENTAL DEALERS

S. S. WHITE COMPANY OF CANADA, LIMITED

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THE S. S. WHITE DENTAL MFG. CO.

PHILADELPHIA, U. S. A.

A Really Practical Book

“Professional Denture Service”

The New Premium Book Given With
The Dental Digest for 1918

Every step in the scientific construction of full and lower dentures is clearly illustrated and described.

Each page carries a photograph of an important step in denture construction from the examination of the mouth to the finished dentures, including improved methods of flasking, packing and vulcanizing. As now planned the book will contain about 200 illustrations.

“Professional Denture Service” will be ready for mailing about January 1st, and the books will be sent in the order of receipt of subscriptions for The Dental Digest.

Subscribe Now!

United States and Possessions	\$1.00
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SOLE MANUFACTURERS OF TRUBYTE TEETH
220 WEST 42ND ST. NEW YORK

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THE BOWROSE INSET SUCTION

(Patented)

WHY

THE BOWROSE INSET
SUCTION IS SUPERIOR
TO ALL OTHERS.

BECAUSE,

being Inset, it is the means of procuring a perfect Vacuum and at the same time allowing the Denture to bed right into position before the suction takes effect.

Soft and comfortable, harmless to the tissues and lasts the life of the Denture.

It is constructed with a pliable metal mould which allows it to be adjusted to the most fragile ridge without fear of fracturing the model.

No. 1 Uppers.

The only system that can be adapted to "V" Shape Palates successfully.

Adds little cost to your Dentures, but adds greatly to their efficiency.

The means of dispensing with wires or bands.

Its simplicity of attachment adds practically no extra time in making a Denture.

No. 2. Lower

for wide flat ridges.

The Bowrose Lower Suction has indeed come as a great boon to the Dentist, having solved the difficult problem of a clean and efficient suction for the flat, ridgeless gum.

Fit them in your next Case and watch results and you will find a Bowrose in a case is worth two others riveted on.

No. 4 Partial Lower.

Directions for Fitting the Bowrose "Inset" Suction

Fill the grooves with soft plaster, press into position and secure with pin. Before packing remove tin-foil, which is to protect the rubber from wax. After case is vulcanized remove metal moulds.

No.

1	Uppers	each	\$0.50
2	Lower	pair	.75
3	Lower	pair	.75
4	Partial Lower.	pair	.50

The Bowrose Inset Suction is being highly praised by every Dentist using it.

FULL DIRECTIONS
WITH EACH SUCTION

Sole Agents

THE DENTAL MANUFACTURING CO., Ltd.,

220 West 42nd Street, 919 Candler Building, New York, U.S.A.

Sold by all Dental Depots.

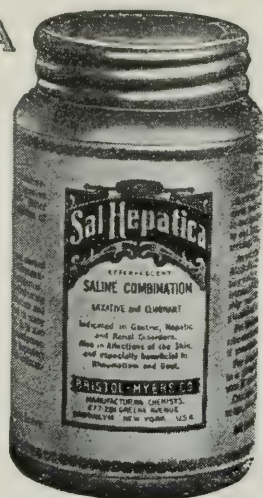
SAL HEPATICA

Materially
AIDS

Local Treatment
In

PYORRHEA

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New York



"SUCCESS" Alloy

1 oz.	\$ 1.75	10 oz.	\$15.00
5 oz.	8.00	20 oz.	27.50

"SUCCESS" INLAY, CROWN AND
BRIDGE CEMENT.

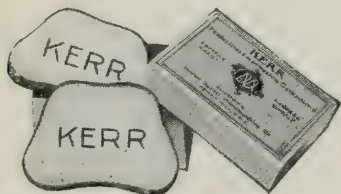
About 4 oz. \$3.50 About 8 oz. \$6.00 About 16 oz. \$10.00
Hydraulic. Permanent. Sets in Saliva.



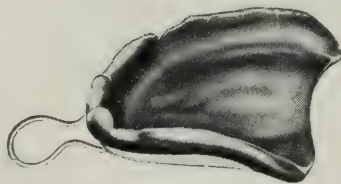
WICKETT & SMITH CO. DENTAL SUPPLIES
Gold & Silver Refiners, Sweep Smelters
& Assayers
71 LOMBARD STREET, TORONTO, ONT.

Kerr Perfection Impression Compound

The Compound That Made Modelling Compound Impressions a Success



Kerr Perfection Impres-
sion Compound Cakes



Test Impression Taken in
Kerr Perfection Impression
Compound Showing Com-
plete Muscle Trimming



Kerr Perfection
Impression Compound Sticks

IT is impossible to take a satisfactory impression with material not adaptable to the purpose.

With the Greene System an approximate or "correctable" impression can be taken, then adapted and conformed in detail to the different tissues and muscles of the mouth, both stationary and movable, until each place is fitted and tested.

Booklet giving information relative to the
Greene System of impression taking with Kerr
Perfection Impression Compound sent on request.

DETROIT DENTAL MANUFACTURING CO.
DETROIT, MICH., U.S.A.



No. 22—C.
Tench-Donham Flask.

A Modern Flask for Scientific Denture Making

Modern dentures are made to extend onto areas heretofore disregarded. This necessitates larger casts and roomier flasks, and the No. 22-C Tench-Donham has been designed to meet these requirements. It is the heaviest and roomiest flask ever offered for use in the Donham Spring Clamp, and can be used only in the 4½-inch Vulcanizer. It will take a larger cast than the largest bolted flask

that could be designed to fit a similar Vulcanizer. The flat sloping line of proximal contact of the ring and bottom permit the grinding of these sections to a practically perfect fit. The flat guide plates are accurately fitted to machined slots, and hold the three sections of the flask in perfect relation. The front portion of the guide plate is beveled to facilitate the handling of cases with marked undercuts, by permitting the ring section of the flask to be drawn slightly forward as it is raised. This is a feature found in no other flask.

The measurements of No. 22-C Flask are as follows:—Outside over all, 4¼ inches from side to side; 3 3-16 inches from front to back; 2¾ inches deep. Inside, 3 13-16 inches from side to side; 2 13-16 inches front to back; 1 15-16 inches deep. The weight of the brass flask is 2¾ pounds.

The added thickness of this flask will tend to protect the casts from fracture when the closing process is carelessly, or through inadvertence forced too quickly, or before the rubber has been sufficiently softened.

It is believed the No. 22-C is the most accurate and rugged flask of the Donham type that has ever been manufactured, and that on account of the special features incorporated in its construction, it will be most useful and entirely worthy of a conspicuous position in the procession of progress in denture making which has come into being in the last few years. One flask can be used in No. 2 Buffalo Donham Spring Clamp with No. 3 Space Filler or two Flasks in the No. 3 Spring Clamp.

The new and peculiar features embodied in this flask were suggested by Dr. Russell W. Tench.

Price, No. 22-C Flask, brass, each \$6.75

Price, No. 22-C Flask, malleable iron, each 3.50

Buffalo Dental Manufacturing Co.

Buffalo, N.Y., U.S.A.

PYORRHOEA-ALVEOLARIS

In the treatment of Pyorrhoea-Alveolaris many Dentists augment local treatment with Sal Lithofos used systemically.

SAL LITHOFOS

The ideal Laxative and Uric Acid Eliminator, at all Drug Stores.

WINGATE CHEMICAL COMPANY

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Ten Reasons—

There are at least ten reasons why every dentist should use

“GOLDDUST” RUBBER

(Trade Mark Reg. U. S. Pat. Off.)

and here are the ten:—

“Golddust” Rubber is

Easier to pack
Low in specific gravity
Exceptionally strong
Durable
Easily polished

Absolutely non-porous
Non-heating to tissues
Comfortable to wear
Economical to use
Beautiful in appearance

Best of all is the reason: “A satisfied patient will more readily pay your fees.” There are no REASONS for NOT using “Golddust” Rubber. Send in the coupon for a sample box FIRST.

PRICES: \$5.25 per pound. \$2.63 per half pound.
1-6th pound sample box (about 5 sheets) ... \$1.00

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\$1.00 for
sample box of
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Lifebuoy Soap is always on guard against dirt and disease. In the home, at your work, for hands and face, for shampoo and bath it will be found always on the watch against germ and microbe. Withal, the rich, creamy Lifebuoy lather makes it a real pleasure to use this "super soap."

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HEALTH SOAP

The old proverb "prevention is better than cure" is another way of saying use Lifebuoy Soap. Start using it to-day and see that the children use it.

The mild antiseptic odor vanishes quickly after use.

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LEVER BROTHERS
LIMITED
TORONTO



To Remove the Dental Pulp

Easily, Quickly and Completely

Use Metric Blue Tempered Broaches



Their temper is uniform.

Their barbs are efficient pulp removers.

Their Price is an Especially Attractive Feature.

One dozen	\$.75
Six dozen	3.50
One gross	6.00
Two gross	10.00

We shall be glad to send you a trial dozen for 75c

THE CLEVELAND DENTAL MFG. CO.

Standard Forceps, Elevators
And Extracting Accessories



Crandall's Scientifically
Tested Non-Zinc Alloy

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Clev-Dent Hand Operating Instruments

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The American Guarantee

Guarantee No. 505

THE AMERICAN X-RAY EQUIPMENT CO., Inc.

MOUNT VERNON, N. Y.

NEW YORK

CHICAGO

SAN FRANCISCO

Purchaser

Model

Address

Machine Number

City

Finish

Date Sold

Current

MANUFACTURING AND SERVICE GUARANTEE

Provisions of Manufacturing Guarantee

1. AMERICAN EQUIPMENT is constructed of high class material by skilled workmen. It is thoroughly tested before leaving Factory and is guaranteed for one year from above purchase date from any defects in materials and workmanship.

2. Defective parts will be replaced free of charge upon notification to the Mount Vernon Office, said defective part or parts, if any, must be returned for inspection before or immediately after replacement is made.

3. It is expressly stipulated that equipment parts broken or damaged by carelessness, neglect or misfortune of the owner or by ordinary wear and tear shall not constitute defective material. However, it is guaranteed that machine parts can be supplied at regular existing prices or charges.

4. X-RAY AND VOLTAGE TUBES ARE NOT GUARANTEED UNDER ANY CIRCUMSTANCES.

Provisions of Service Guarantee

1. AMERICAN EQUIPMENT is guaranteed to take satisfactory radiographs of the teeth and jaws and all other bony structures of the body except

In order that the maximum amount of benefit may be derived from the use of this machine, the following SERVICE is guaranteed to the original purchaser under the conditions herein definitely specified.

2. The purchaser agrees to read the complete operating directions included with this machine, before attempting to operate the machine on his own account. It is also recommended that someone of the tasks on Dental Radiography be read.

3. After service time wiring has been installed we agree to give the service of a competent demonstrator for a two-hour period for initial instruction at a convenient time to be arranged between the purchaser and us. Furthermore, we agree to give ten hours service at times convenient to us during the first twelve months from date of this guarantee, for the inspection of machine and consultation with purchaser. A call of less than one hour shall be considered as one hour and the following shall be considered as one hour: Additional time spent in purchaser's office will be charged for at _____ per hour.

4. Purchasers are welcome to consult us in our office or by telephone with regard to the operation of the machine, at any time and without charge.

5. The entire organization of the manufacturers at Mount Vernon, New York, Chicago or San Francisco is placed at the disposal of the purchaser, whose letters, telephone calls or personal calls with reference to any subject will be returned and without cost.

6. Representatives of the manufacturers will be in the purchaser's vicinity from time to time. Calls at purchaser's office by such representatives will be rated as noted in Section 3.

Served Guaranteed by
The American X-Ray Equipment Co.
F. L. HIGGINS, Gen. Mgr.

Signed

Must be signed by the Dealer

No. 505

I

Good for one hour's inspection and instruction service on American X-Ray Co. Machine No. _____
If used within one year from date, a call of less than one hour is considered as one hour.

Dated

No. 505

K

Good for one hour's inspection and instruction service on American X-Ray Co. Machine No. _____
If used within one year from date, a call of less than one hour is considered as one hour.

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J

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If used within one year from date, a call of less than one hour is considered as one hour.

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I

Good for one hour's inspection and instruction service on American X-Ray Co. Machine No. _____
If used within one year from date, a call of less than one hour is considered as one hour.

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Dated

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F

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Dated

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E

Good for one hour's inspection and instruction service on American X-Ray Co. Machine No. _____
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D

Good for one hour's inspection and instruction service on American X-Ray Co. Machine No. _____
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No. 505

C

Good for one hour's inspection and instruction service on American X-Ray Co. Machine No. _____
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No. 505

B

Good for one hour's inspection and instruction service on American X-Ray Co. Machine No. _____
If used within one year from date, a call of less than one hour is considered as one hour.

Dated

No. 505

A

Good for one hour's inspection and instruction service on American X-Ray Co. Machine No. _____
If used within one year from date, a call of less than one hour is considered as one hour.

Dated

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Get the American Machine and Service. Ask your Dealer about it to-day.

AMERICAN X-RAY EQUIPMENT CO. Inc.

Factory and Executive Office: MT. VERNON, N.Y.

SALESROOMS:

NEW YORK

CHICAGO

SAN FRANCISCO

When Writing Advertisers Mention Oral Health.

Lend to Your Country—All Canada is Your Security

EVERY CANADIAN DENTIST

is urged to subscribe to

Canada's Victory Loan

GOLD BONDS (5, 10 or 20 year) free from taxes, issued at Par, and yielding $5\frac{1}{2}\%$

Denominations \$50, \$100, \$500, \$1,000

"The man, be he rich or poor, is little to be envied, who at this supreme moment fails to bring forward his savings for the security of his country."

Honest Work and Honest Material

We are making partial dentures with properly fitted clasps and indirect retainers.

We endeavor particularly to have your work returned when you want it.

ALLAN & ROLLASTON

DENTAL LABORATORY

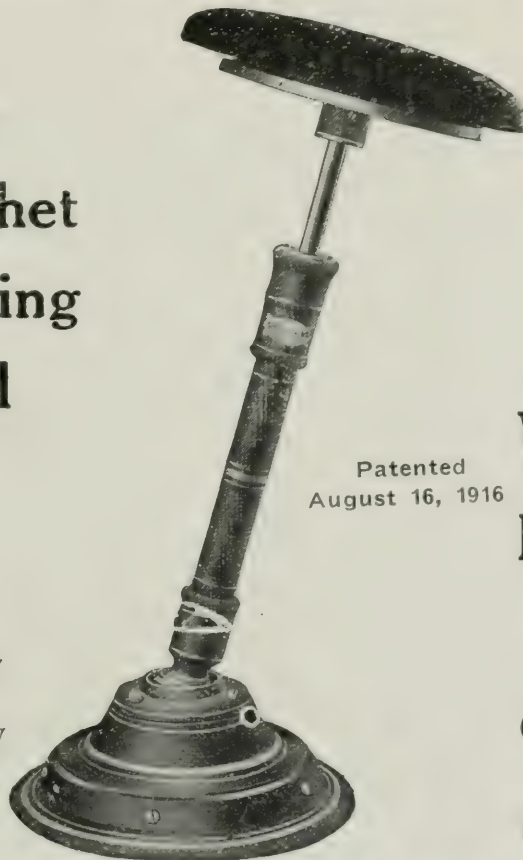
Room 114, 2 College Street

Toronto.

The Ideal Holiday Gift

A Suggestion for Friends, Wife or Sweetheart

**The
Noratchet
Operating
Stool**



Patented
August 16, 1916

**Will Save
Nerves**

**Preserve
Health**

**Increase
Working Time**

Lengthen Life

**Automatically
Meets Every
Motion**

**When Slightly
Inclined
Chest is Thrown
Forward and
Shoulders Back**

A pleasing, agreeable and esthetic, as well as a most sensible and practical addition to the equipment of any office, having no projecting levers; its mechanical features are such as skill, ingenuity and long experience suggest, leaving nothing to be desired.

While the seat revolves freely, such revolution has nothing to do with its height, that feature being controlled by a gripping device within the standard which cannot slip under the weight of the operator. The seat is adjusted up or down by a touch, the adjusting lever being a simple steel ring under the seat, entirely out of the way, yet always just where either hand drops naturally, wherever that may be. No pushing is required, since there are no springs to overcome. It is transported about the office by tipping slightly and rolling upon its base.

The Noratchet Operating Stool Will Help

PRICES

Noratchet Operating Stool	\$27.00
Stock Finishes—Decorated black, gray, mahogany, blue, and white enamel.	
*Stock Upholstery—Maroon and green plush; green blue, gray and maroon hair-cloth; green, black, maroon, gray and red leather.	
Special finishes and upholstery, other than above, extra	\$4.00
Special finish only, other than above, extra	2.75
Special upholstery only, other than above, extra	1.40
Extra height for men over six feet tall, extra	2.80

*Subject to market conditions.

Your Dealer will be glad to Demonstrate THIS Stool and fill your order.

The Pansom & Randolph Company
TOLEDO, O. U. S. A.

BLUE ISLAND SPECIALTY CO.

BLUE ISLAND, ILL., U. S. A.

**ORTHODONTIC
APPLIANCES**

MADE FROM

**Precious Metal, Special Prepared Nickel Silver and
The Blue Island Brand Non-Corrosive Metal, Gold Color**

**SPECIAL APPLIANCES MADE TO
ORDER AND FITTED TO MODELS**

A postal card brings our new catalogue "de Luxe" edition, 100 pages, 1500 illustrations, and also a 12 page catalogue showing Impression Trays, full size illustrations, and Specialties for the Dental Office, 20 pages, 165 illustrations.

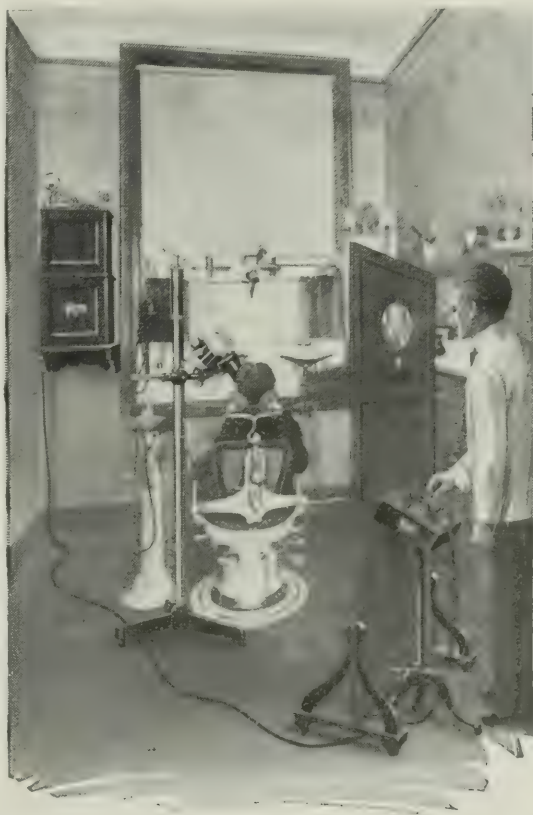
**Our Goods are For Sale by Dental Dealers
Everywhere**

When writing advertisers mention Oral Health.



Practice Dentistry With Authentic X-Ray Information

—if you do not have a reliable X-Ray laboratory near
you install one of your own.



There is a Victor Service Station in your own locality.

Catalog, literature and estimates on Victor dental equipments gladly sent on request—and without obligation. The prices range from \$2.00 and upward.

VICTOR ELECTRIC CORPORATION

CHICAGO
236 S. Robey St.

CAMBRIDGE, MASS.
66 Broadway

NEW YORK
131 E. 23rd St.

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Chandler & Fisher, Ltd.
Keewayden Bldg.

VANCOUVER
Chandler & Fisher, Ltd.
808 Richards St.

When writing advertisers mention Oral Health.

Important Points About SOMNOFORM



Somnoform is a real practice builder because it is easy to administer and patients actually like to take it.

It is easy to administer because of the simplicity of the outfit, and each dose is contained in an individual capsule.

It has a wonderful record for safety, and when properly administered can be depended upon to give entirely satisfactory results.

Its technique is easily mastered.

Our free text book and lessons Nos. 1, 2, 3 and 4 of our Post Graduate course will supply you with all the necessary information.

A study of these facts will convince you that you need an outfit in your office.

Send your order to-day.

Send me
your free text
book. Enclosed
find 60 cents for
which send me lessons
No. 1, 2, 3 and 4 of your
Post Graduate Course.

Stratford-Cookson Co.

28 South 40th Street

PHILADELPHIA, PA.

Name

Address

Dealer's Name

Does Your Operating Room inspire confidence in your patients?

An antiquated equipment unquestionably has a direct bearing on the loss of patronage which in turn reduces the value of a practice.

Ritter Dental Equipment in your operating rooms will accomplish many important things—

It will reduce floor space required.

It will reduce footsteps and thus increase your efficiency.

It will make a lasting impression upon your patients.

It will give you just cause for taking pride in the appearance of your offices.

May we have the pleasure of sending you descriptive literature touching upon our product and service to the profession?

THE RITTER DENTAL MFG. CO.

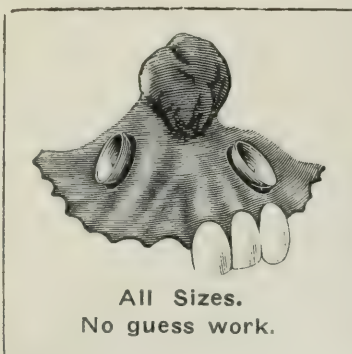
ROCHESTER, N.Y.

CHICAGO

PHILADELPHIA

NEW YORK





LOOK!

Another cleft palate case that found relief in the "EUREKA" retainer.

Their superiority of renewing cup with others is apparent at a glance.

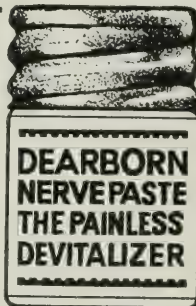
Comparison sells it—you need no extras—easily attached—on and off in a second by patient.

GIVE THEM A TRIAL—THAT IS ALL WE ASK.

Upper or Lower \$2.50 per box of six.

Eureka Suction Co. - Loudonville, Ohio

Without Pain —
desentises dentine and devitalizes pulp — that's what Dearborn Nerve Paste will do. On direct exposure, one application is sufficient. When dentine is too sensitive to excavate, a second application is sometimes necessary. The first application will obtund the most sensitive dentine in four to six hours.



Try Dearborn Nerve Paste without cost to you. If you like it, you pay \$1.50 in United States or \$1.75 in Canada for it. If you don't, send it back and it won't cost you a cent. You'll be surprised and pleased with the results. You will be able to work faster and do more efficient work. Your supply dealer has it in stock. He'll send you a jar on trial. If he happens to be out of it, send direct to us and give us his name. *Make a note of this now so you won't forget to include it in your next supply order.*

HALL DENTAL SUPPLY COMPANY
222 N. Wabash Avenue : : : Chicago, Ill.

NO DENTAL LABORATORY IS COMPLETE WITHOUT

E. J. McCORMICK'S



Also made in Orange, Red, Maroon, Black and other colors.

These Rubbers are the best adapted in the world for dental purposes, being remarkable for their great strength, exceptional elasticity and beautiful finish, also for the ease with which they are packed.

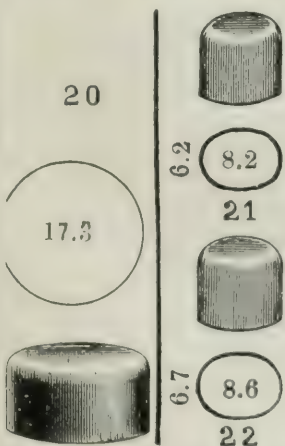
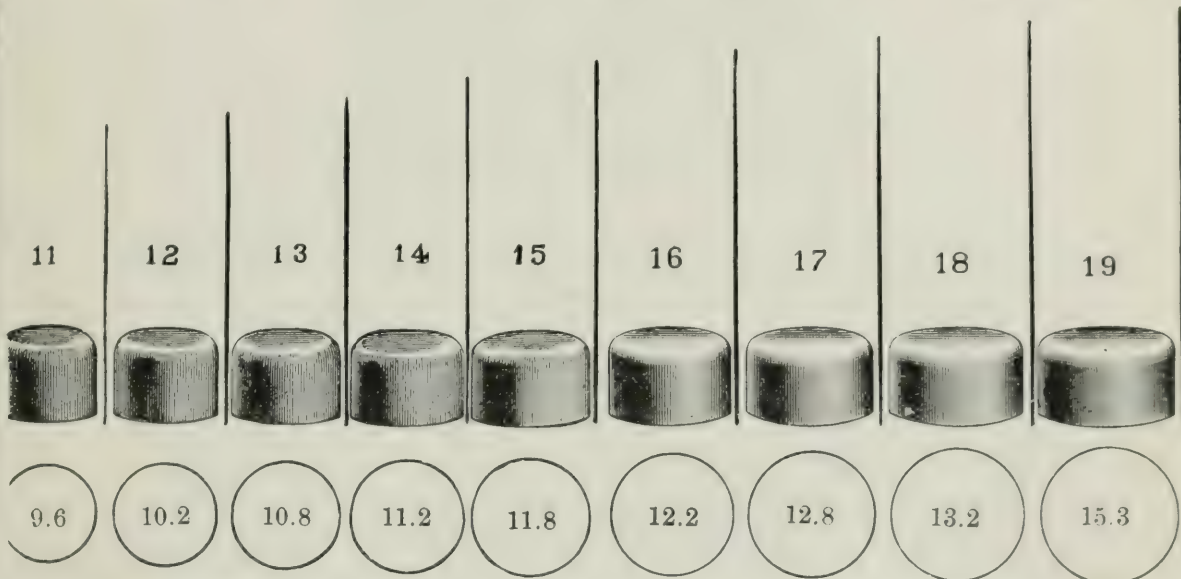
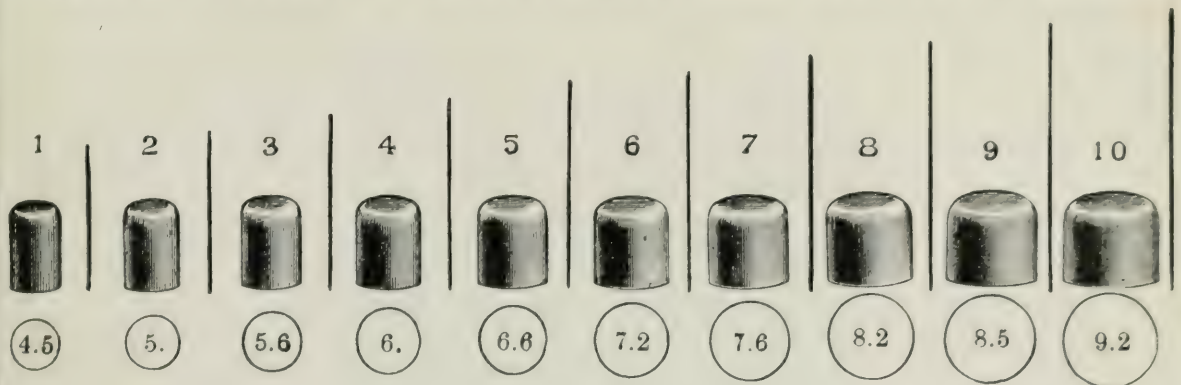
Ask your dealer for them. If not obtainable send to

E. J. McCORMICK RUBBER CO.

355-357 W. 36th St., New York City

When Writing Advertisers Mention Oral Health.

National Gold Shells and Disks



The vertical lines are the corresponding wire measurements of the shells, while the diameters are shown in millimeters.

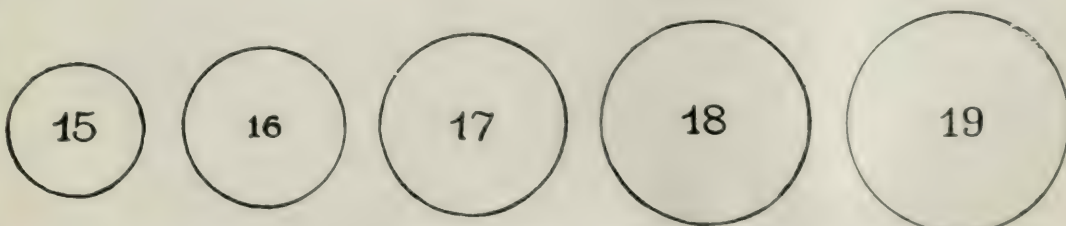
All National Gold Products can be procured from your own dealer.

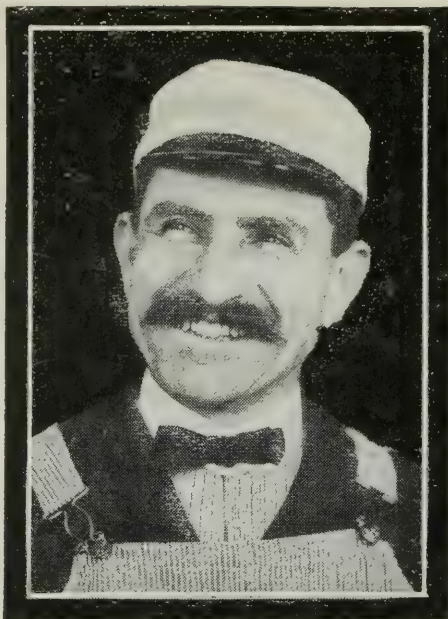
Manufactured and guaranteed by

National Refining Co.

69 Grosvenor St.

Toronto





The Man in the Street

THE instinct to make the best of our looks is not confined to the fair sex.

Men take pride in their appearance—all classes.

Nothing so quickly stamps a man as his teeth. Only the races a remove from barbarism take kindly to mutilations which make teeth conspicuous.

Synthetic Porcelain is the ideal material for filling and restoring facial harmony.

It has crushing power and strength much beyond the margin of safety. Properly used, it simulates nature so closely in translucency and color that it merges with the real tooth structure—even to closest observation.

To the "Master of Industry" or "The Man in the Street" Synthetic Porcelain restores the confidence that Time is not taking toll of his appearance.

Nature's
Duplicate—
de Trey's
Synthetic
Porcelain

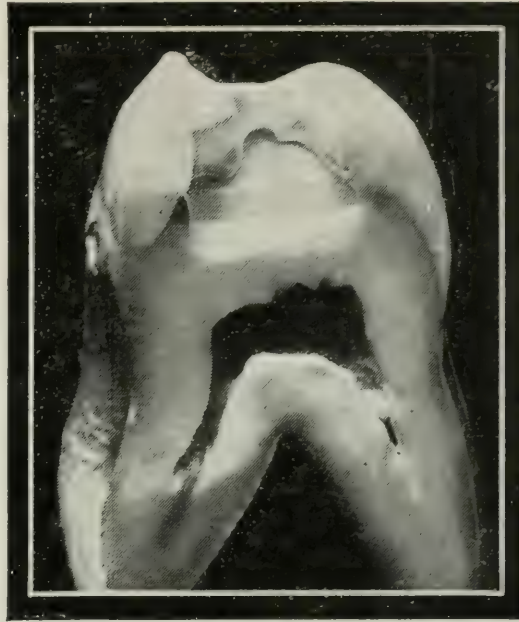


THE L. D. CAULK COMPANY
OF CANADA, Ltd.

Caulk Building

172 John Street

TORONTO, ONTARIO



Putting Permanence in Amalgam

A MALGAM in the majority of cases is used for larger restorations than gold or the silicates.

This means a comparatively large quantity of metallic material filling the cavity. If the tooth is vital it should always be protected by a cavity lining to prevent thermal and electrical shock.

If the cavity is not particularly deep, use Caulk's Cavity Lining, otherwise use Caulk's Zinc Cement. In either case protection is afforded.

Where the cavity is of sufficient size to warrant its use, Caulk's Zinc Cement has the additional advantage of making the amalgam filling an inlay, inasmuch as the amalgam is packed into the cavity while the cement is still in a plastic state.

If care is taken to see that encroaching cement is chiseled from the margins, this will be found a most satisfactory phase of amalgam work.

And for amalgam capable of the best results nothing can surpass Twentieth Century Alloy Perfected, in combination with Caulk's Mercury.

Amalgam Inlays
of Twentieth
Century Alloy
Perfected, are
Permanence Itself.



**THE L. D. CAULK COMPANY
OF CANADA, Ltd.**

Caulk Building

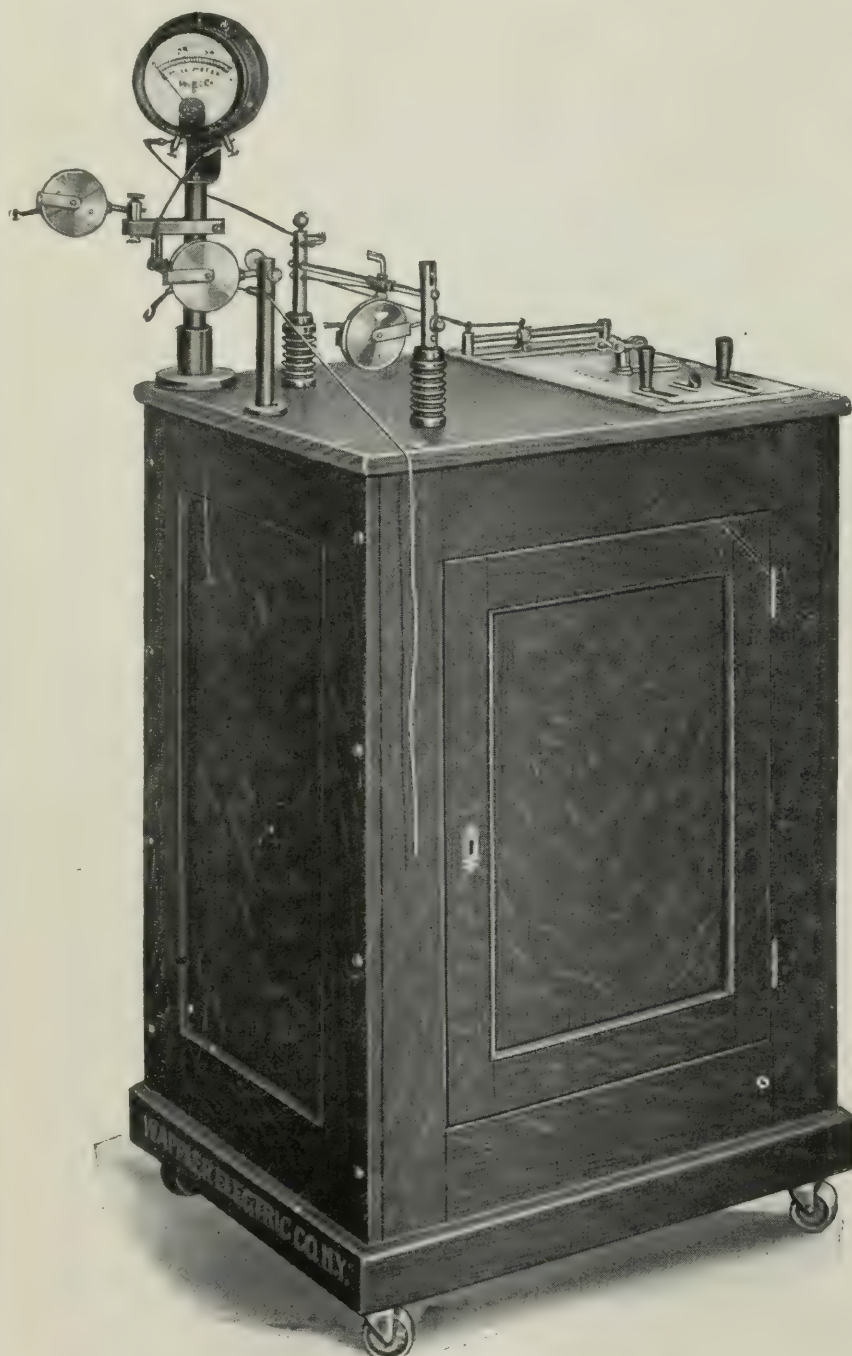
172 John Street

TORONTO, ONTARIO

6-17 D-3

Wappler Empire Model No. 1

Output 50 milliamperes, 5 Benoist



Slightly larger than preceding model. Eight inch Gap.

Dimensions of Cabinet:
23x26x41 in.

Write for Catalogue and Information to

Sole Canadian Agents

Ingram & Bell, Limited

256 McCaul Street

-

-

Toronto, Can.



The Vital Test

Accidents may be minimized
by the use of the quick-stop
Anti-skids—"Traction" or
"Special."

Will your present tires stand
you in good stead when you
want to make that quick stop
which may mean so much to
someone else's life or your
own?

"SPECIAL" **TIRES** "TRACTION"

A. 88

An Aseptic Zinc Cement



Smith's Copper Cement is an aseptic dressing for the cavity.

When the surgeon binds up the wound he doesn't wait for mortification to set in before he applies a germicide.

He believes in preparedness.

He anticipates the effect by removing the cause.

The formula of **Smith's Copper Cement** is that of oxyphosphate of zinc cement plus copper in a form which

WILL NOT DISCOLOR IN THE MOUTH.

Copper is an antiseptic. It possesses germicidal, therapeutic and sedative properties.

And because the copper in **Smith's Copper Cement** will not discolor in the mouth, it may be used either as a copper cement or as a zinc cement.

It sterilizes the cavity, enabling you to practise surgical preparedness.

Smith's Copper Cement is made in 8 light shades in the laboratories of

LEE S. SMITH & SON MFG. CO.

449 Spadina Avenue

Toronto

Canada

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